

# COAL AGE

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## Americanizing the Foreigner

PATRIOTISM is the oil that lubricates the machinery of victory. Lacking vision or ambition, we shall find ourselves unready to do our utmost at this time of the country's great need. We must be enabled to sense our citizenship, or we will not work hard enough and steady enough and live rigorously enough to buy a fair quota of Liberty Bonds and do our part for the Red Cross.

Flag Day, which will occur on June 14, offers us another opportunity to rededicate ourselves to the purposes that we recognize are noblest in our national life and to deepen the pure spirit of Americanism in the hearts of all Americans. It also gives us another occasion on which we can show to those who have come to this land from beyond the seas the aims that animate our hearts and regulate our lives.

But let us beware of some of the dangers of Flag Day. That day for the foreigner should be a time of welcome and not of reprobation. The foreigner will never be made a good citizen by condemnation of his friends across the ocean. The bitternesses aroused by unfavorable comparisons have done not a little to vex and disgust those who have come among us.

Only a little while ago our orators were repeatedly and unctuously thanking the Almighty that we, unlike the nations of Europe, were not engaged in slaughter. We are now, as we should have been from the first, fighting in the advocacy of Democracy and Justice. Let us not spend our time, therefore, in vain comparisons, which are always unfortunate and sometimes not fair. Worse than boasting is the disparagement of others.

We have much to be proud of and much to be grateful for. Let us congratulate ourselves on what we have. Let us not be like a certain large generality of people who can only get happiness out of the peace following a thunderstorm by rejoicing that some other man's barn was

hit and not theirs. They cannot rejoice in a good crop unless they are able to say that some other man's field suffered from a drought. They find no points for admiration in their own trotter unless they can point to some poor cripple that it passed on the road.

It may be that the foreigner is the man of the stricken barn, the blighted field and the crippled horse, but no good will come of reminding him of his misfortunes. In the language of the street, "Have a heart." What a foreigner wants more than your praise of America or your denunciation of his fatherland or motherland is the grip of your hand, the tremor of your voice and the exaltation of service that your patriotism evokes.

Much Flag Day oratory is like the red flag waved in the eyes of a bull. It is utterly undiscerning and unsympathetic. "Come with us," should be the message of the day to the foreigner. "Come with us, and we together will make this America a new earth—a country full of sympathy and understanding, a land of domestic peace and helpfulness, a land of unity and good works. We have given an earnest in the past of our good will to all men. It is our purpose that in the future the measure of our intentions shall be no less inclusive and generous."

On Flag Day there will be some mines in the bituminous fields without opportunity to work. Let such mines hold an all-day celebration. Other plants in the same district, with the promise of cars for Flag Day, can make their commemoration after the day's work is finished.

The operator should not fail to give his fullest support to the national movement now being made for the proper observance of this important holiday. A celebration may cost him some money, but if he hesitates to give a little to the performance of this patriotic duty he is lacking in the spirit of a true American.

## IDEAS AND SUGGESTIONS

### Piatt Car Spragger

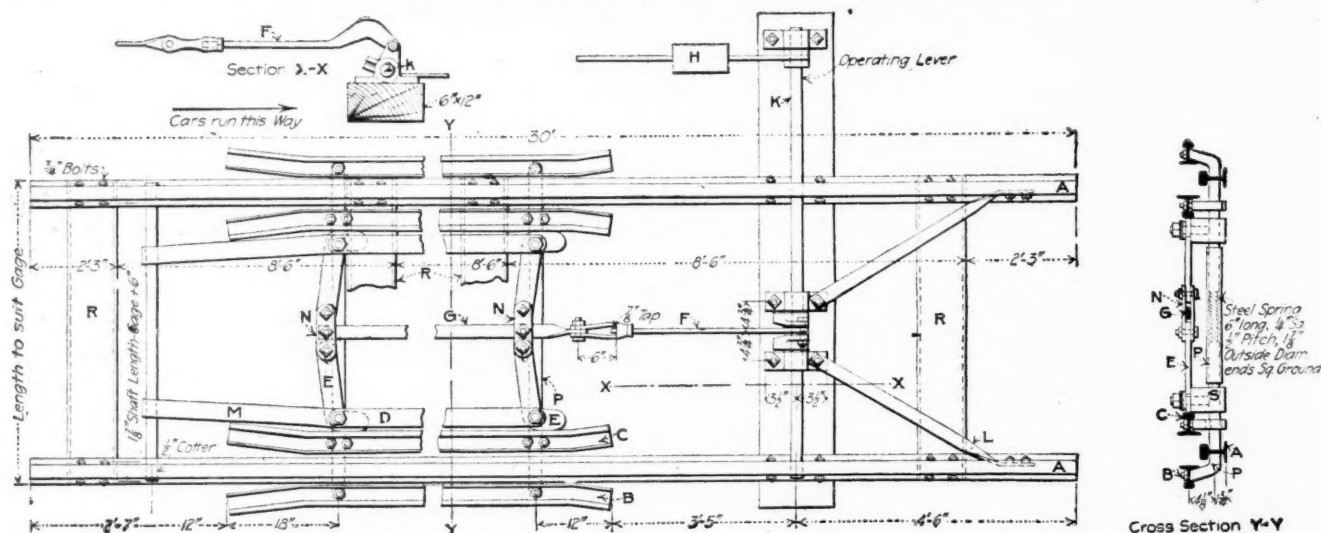
At certain points around collieries where trips of mine cars are handled, it is essential that the movement of a car or a trip of cars be checked within a car's length or even less. It is readily seen that, at the foot of car hoists or planes at breakers, for example, where loaded cars are feeding in continually, they must be controlled absolutely. It is rather unfortunate when a loaded trip piles up in the shaft bottom.

An official at the Franklin colliery of the Lehigh Valley Coal Co., near Wilkes-Barre, Penn., has worked out a scheme for spragging or retarding cars which is shown in detail in the accompanying illustration. It is known as the Piatt car spragger and is the invention of James Piatt, outside foreman at the Franklin colliery. It is installed at the foot of the car hoist of the Franklin breaker, among other applications, and was

wheels firmly, then this space is reduced. This is done by bringing the rails *B* closer together by the adjusting link *P*.

The movable rails *C* are operated by simple mechanism. At intervals along the rails *C*, on either side, are the cams *E*; the short arm of these cams engages the rails *C*. The other ends of the cams are connected by the yokes *N*, the reach rods *G* and the toggle iron *F* to the lever shaft *K*. The forward movement of the operating lever *H* on the shaft *K*, through the foregoing connections, produces a movement of the rails *C* toward the rails *B*. The pivot of the cams *E* is rigidly attached to the iron *P* by means of the irons *S*, which are shrunk on *P*.

The track rails *A* are tied together by the 8-in. channels *R*. The lever shaft is mounted on a 6 x 12-in. oak tie; and the toggles, with their operating mechanism,



CAR SPRAGGER IN USE AT FRANKLIN COLLIERY OF LEHIGH VALLEY COAL CO., NEAR WILKES-BARRE, PENN.

doing effective work at the time the writer saw it in operation.

By reference to the accompanying illustration, its method of operation may readily be seen. Briefly, the rims of car wheels are clamped in a vise at the rails on either side at the mine car by the simple throw of a lever. Its action is positive and entirely reliable. As to the details of the device: The mechanism of the retarder is attached to the track rails *A*, within a few feet of the bottom of the hoist. *B* and *C* are rails which constitute the clamp holding the rims of mine car wheels. These rails *B* and *C* have their base vertical and are so adjusted as to come in contact with the rims of wheels when thrown into engagement.

The outside clamp rails *B* are rigidly connected by the linking iron *P*. Their position relative to each other is capable of adjustment. Thus when the rails *C* are thrown into clamping position they move toward the rails *B*. If the space between the rails *B* and *C*, in clamping position, is not such as to hold the rims of

are held in position by the strap irons *M* and *D*. In the illustration the retarder is shown in "open position"—cars can now pass through. When the lever *H* is thrown forward (in the direction loaded cars run), the connecting-rods move the toggles, which force the rails *C* closer to the rails *B*. This vise-like action tends to clamp the rims of car wheels and stop their movement.

When the lever *H* is in its extreme forward position the toggle is on a "dead center," which tends to lock the mechanism in its clamping position. Under the conditions noted the lever *H* rests on the ground and is largely held in that position by the disk weight attached to it, as shown in the illustration. This retarder has the power to hold a trip of loaded cars. If little work is to be done, as is often the case when only a few cars feed in slowly, then ordinary sprags are frequently used. Sometimes sprags do not hold well in wet weather when the rails are slippery. In such cases, and when a long trip gains momentum, then the Piatt spragger comes to the rescue and will do the work well.

## Makeshift Rail Bender

BY J. A. SMITH  
Albert, W. Va.

Mr. Dalton's article in *Coal Age* of Apr. 27 brought to mind a makeshift rail bender used in mines where the thickness of the coal bed is less than 6 ft. In many mines using 12 to 16 lb. steel rail in rooms the trackman lays the switch at the foot of the room, after which the miner is required to lay his track and any "turns" necessary. As soon as the first crosscut is driven far enough in to require a turn, if no rail bender is available the miner curves a turn as follows:

He cuts a prop a few inches shorter than the height of seam and then marks the rails at points where curves are to begin. The prop is set vertically and the rail laid between the top of the prop and the roof, with the end of the rail extending through until the point where the curve starts is just over the prop. By bearing down on the long end the rail is bent without difficulty. Rail is then pushed through 12 in. or thereabout and again bent. This is continued until only 4 ft. remains uncurved.

The rail is now spiked in place and the final 4 ft. is curved by slipping a pipe sleeve over the rail and inserting a claw bar therein, when sufficient leverage is obtained to bend the rail to within 12 in. of the end. Both rails of a turn can be curved in 15 min., or less time than it takes to procure a regular bender. The sleeve mentioned is also useful in straightening a rail which is bent close to the end.

## Precautions in the Use of Gasoline

In order to minimize the risk of fires, observe these precautions:

1. Keep open lights away from all gasoline cans or tanks, feed pipes, and engines.
2. Use only closed cans or tanks for carrying gasoline into the mine.
3. Use only a closed can, like an oil can, for priming with gasoline, and keep the can where it cannot be knocked over.
4. Never store more than five gallons of gasoline or as much more as is required for one day's work in the mine.
5. Do not let oily waste or rags lie in the engine room. Put them in a metal pail. Use sand to absorb oil drippings.
6. Never use water to extinguish a gasoline fire. Always use a chemical fire extinguisher or smother the fire with sand. Keep a supply of sand in the engine room and the storage room.
7. Use as little wood as possible for fittings in engine room. Where possible cover wooden posts, etc., with asbestos board.

To minimize the danger of explosions:

1. Have the engine room and the storeroom well ventilated.
2. Never let gasoline stand in open cans or tanks.
3. Do not pour gasoline from one container into another near open lights.
4. Do not spill gasoline.
5. Do not use gasoline for cleaning in a closed room.
6. Unless all the openings of empty cans or barrels

are closed, always store them with the openings down so that the vapors may escape.

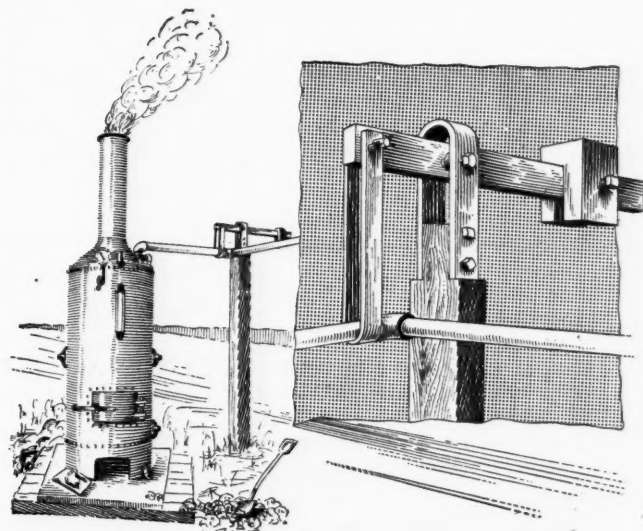
To minimize the danger from the exhaust gases of a gasoline engine:

1. Set the carburetor, or mixing valve, to give as lean a mixture as will run the engine.
2. Pipe the exhaust gases out of the engine room.
3. Do not work or even stand near the end of the exhaust pipe when the engine is running.
4. Do not try to purify the exhaust by turning it under water.
5. Unless the ventilation in the place where the engine is used is ample and positive, pipe the exhaust gases to some point where there is such ventilation, or pipe them to the surface.—*Technical Paper, No. 174, U. S. Bureau of Mines.*

## Unique Expansion Joint

BY L. V. LAUTHER  
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The vertical boiler of an 8-hp. hoisting engine expanded nearly  $\frac{3}{4}$  in. when the fire was started in the cold boiler in the morning. Owing to the climatic conditions, the fire was permitted to go out every night and



GENERAL VIEW AND DETAIL OF PIPE SUPPORT

the water also was blown off. No outside insulation was provided on the entire outfit. The repeated expansion and contraction soon exerted an injurious influence on the pipe joints. The latter became loose and steam began to leak from the pipe line from almost every joint. The prospector, either because he was not familiar with power-plant equipment, or was adverse to incurring extra expense, rigged up an ingenious device which tided him over his difficulty.

This outfit, shown in the accompanying illustration, possessed the advantage that it not only provided for expansion, but also took the weight in such a manner that it was always in right proportion to the height of the boiler.

Of course, the right position for the counterweight was found by experiment. The pivot was well greased with graphite. The drawing is sufficiently clear to make the device comprehensive to anyone dealing with this kind of steam boiler.



# Centrifugal Mine Pumps

By OTTO HAENTJENS

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WITH the increasing number of centrifugal pump installations in mines, a thorough knowledge of the principles of theory and design of these machines becomes necessary. Centrifugal pumps vary in many ways from direct-acting pumps and are a puzzle to men not familiar with their construction and their sometimes peculiar behavior. Really they are quite simple machines, consisting only of a few parts.

Although the theory of these pumps is complicated, it can be reduced to one simple formula, from which can be derived the principal laws that govern the construction and operation of centrifugal pumps. As this article is written not for the designer but mainly for the mining engineer it is not necessary to show how this formula was derived and lengthy theoretical discussion is omitted.

**P**RESSURE in a centrifugal pump is produced by centrifugal force and by transforming velocity into pressure. The peripheral speed of the impeller determines the centrifugal force and the outlet opening

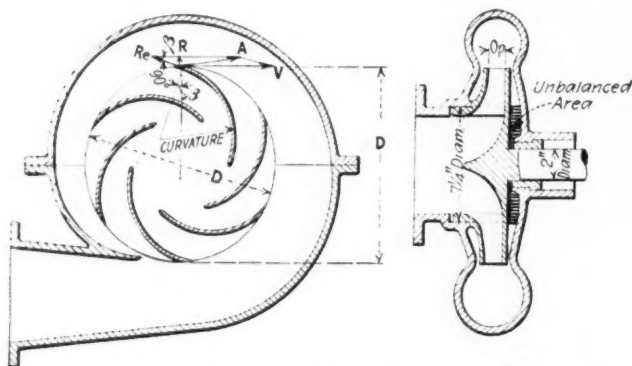


FIG. 1. OUTLINE AND FORCE DIAGRAM OF A CENTRIFUGAL PUMP

of the impeller and the curvature of the blade determine the absolute velocity to be transformed into pressure. Referring to Fig. 1:

$D$  = Impeller diameter, in inches;

$O_p$  = Impeller opening, in inches;

$V$  = Peripheral velocity of impeller, in ft. per

$$\text{sec.} = \frac{D}{229} \times \text{r.p.m.};$$

$$R = \text{Radial velocity, in ft. per sec.} = \frac{\text{G.p.m.}}{3.12 \times \pi \times D \times O_p};$$

$$R_e = \text{Relative velocity along the blades} = \frac{R}{\sin \beta};$$

$$A = \text{Absolute velocity at which the water is discharged from the impeller, in ft. per sec.} = \sqrt{R^2 + X^2};$$

$\beta$  = Blade angle.

The theoretical head  $H$  which a centrifugal pump develops is

$$H = \frac{V \times \left( V - \frac{R}{\tan \beta} \right)}{g}$$

or

$$H = \frac{V \times X}{32} \quad (\text{See Fig. 2})$$

The theoretical horsepower required to raise 1 gal. of water  $H$  feet high per minute is

$$Hp. = \frac{1}{3960} \times H$$

Doubling the speed of the pump doubles  $R$  (see Fig. 3) and therefore the capacity, as  $R$  is a direct function of the capacity. Doubling the speed also doubles  $X$ , and the head  $H$  therefore increases to:

$$\frac{2V \times 2X}{32} = 4 \times \frac{V \times X}{32} = 4 \times H$$

Doubling the speed increases the horsepower to:

$$2 \times \frac{1}{3960} \times 4 \times \frac{V \times X}{32} = 8 \times \frac{1}{3960} \times H$$

If a centrifugal pump, running at 1200 r.p.m. and delivering 1000 g.p.m. against a 100-ft. head and requiring 50 hp. be speeded up to 2400 r.p.m., the capacity would increase to  $2 \times 1000 = 2000$  g.p.m., the head to  $4 \times 100 = 400$  ft., and the horsepower to  $8 \times 50 = 400$  hp., or, generally speaking, if the speed of a centrifugal pump is changed, the capacity changes in direct proportion to the speed, the head as the square and the horsepower as the cube of the speed.

If the speed of a centrifugal pump is kept constant, but the capacity is reduced or increased by throttling or opening the discharge valve,  $R$  changes in direct proportion to the capacity. As  $R$  decreases,  $X$  increases and therefore the head produced by the pump will increase. If the discharge valve is shut entirely so that no water can be discharged,  $R$  becomes zero and  $X = V$  and  $H = \frac{V \times V}{32} = \frac{V^2}{32}$  (zero capacity, maximum head).

If the discharge valve is fully opened,  $R$  becomes a

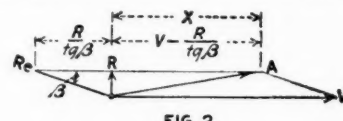


FIG. 2

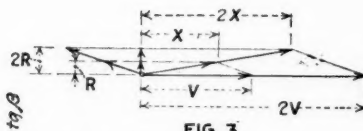


FIG. 3



FIG. 4

FIGS. 2, 3 AND 4. VARIOUS PUMP DIAGRAMS

maximum =  $V \times \tan \beta$  (see Fig. 4) and  $X$  becomes zero and the pump would theoretically produce a head

$$H = \frac{V \times 0}{32} = 0 \quad (\text{maximum capacity zero head})$$

The maximum theoretical capacity is:

$$V \times \tan \beta \times 3.12 \times \pi \times D \times O_p \text{ gal. per min.}$$

Having determined the maximum head and the maximum capacity, in plotting these points on cross-section paper (see Fig. 5) all intermediate points must fall



on a straight line connecting these two. This line may then be called the theoretical head-capacity line.

The horsepower curve corresponding to this head-capacity line can easily be figured and represents a parabola, as shown in Fig. 5.

The curves known as characteristic curves indicate the head developed at different deliveries (head-capac-

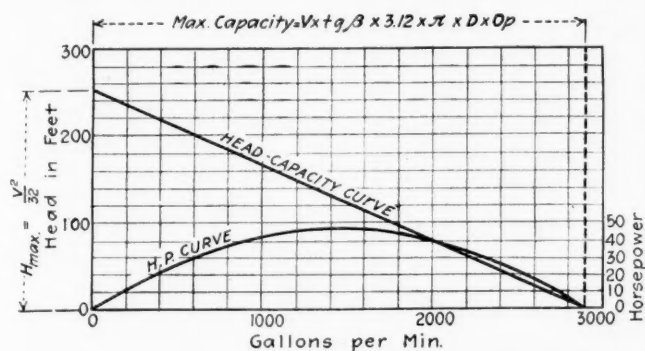


FIG. 5. THE HEAD-CAPACITY AND HORSEPOWER CURVES OF A PUMP

ity curve), the horsepower required to drive the pump at different deliveries (horsepower curve), and the efficiency developed by the pump at different deliveries (efficiency curve). They are obtained by testing the pump at constant speed on the factory test stand. The actual head-capacity curve differs considerably from the theoretical head-capacity line, but the inclination of the theoretical line influences the shape of the actual head-capacity curve and the horsepower curve to such an extent that theoretical head-capacity lines can be used for comparing the characteristics of various impellers.

Fig. 6 shows the diagram of a 6-in. pump impeller and Fig. 7 shows the theoretical head-capacity line, the actual head-capacity curve and the efficiency curve of this impeller. The best efficiency coincides with the "condition point," that is the conditions for which the pump was intended—namely, 1000 g.p.m. against a 100-ft. head. Although this is desirable, it will in practice not always be the case, especially with volute pumps.

Manufacturers sell a pump for any condition within certain economical limits, as shown in Fig. 7, in order to reduce the number of patterns for casings and impellers. It is the aim of the designer to produce a pump that gives good efficiency over a wide range—that is, large economical limits.

It will be seen from Fig. 7 that at the condition point the actual head obtained is only 60 per cent. of the theoretical head; or, in other words, the hydraulic efficiency is 60 per cent. The hydraulic efficiency varies with the delivery and usually reaches a maximum, a little ahead of the best efficiency point (in Fig. 7 at 900 g.p.m.). Shock losses and leakage within the pump determine the magnitude of the hydraulic efficiency, but the hydraulic efficiency of a centrifugal pump does not directly affect the mechanical efficiency. A centrifugal pump may have a hydraulic efficiency of 60 per cent. and yet have a mechanical efficiency of 70 per cent. or over. The hydraulic efficiency at the condition point varies between 55 and 75 per cent., depending on the size and type of the pump. At shut-off, the

hydraulic efficiency varies between 45 and 55 per cent., depending on the impeller dimensions. It is usually around 50 per cent.

#### EFFECT OF VANE ANGLE ON HEAD-CAPACITY AND HORSEPOWER CURVES

The blade angle of the impeller, whose velocity diagram is shown in Fig. 6, was 18 deg. If this angle is changed to 35 deg.,  $X$  increases to 75.7 (see Fig. 8). Assuming an hydraulic efficiency of 60 per cent. as before, the actual head produced by this impeller would be  $0.6 \times \frac{75.7 \times 90}{32} = 127.5$  ft. In order to produce only 100 ft. head with this 35-deg. impeller, the peripheral velocity must be reduced to 80.5 ft. In Fig. 9 are shown the theoretical head-capacity lines with their corresponding horsepower curves and the actual head-capacity curves of the two impellers.

It will be noted that: (1) A steep angle gives a low shut-off pressure, one that may be considerably below the condition point. This may make it impossible to start a pump when the column pipe is filled, as the shut-off pressure is not sufficient to open the check valve in the column pipe. In order to start such a pump a certain amount of water must first be bypassed, so that the pressure can build up. (2) A flat angle produces a steep head-capacity curve. If the pump draws water from a sump whose level changes (as is usually the case), the suction lift gradually increases. Assuming that the level changes 10 ft., this would increase the total head against which the pump has to work to 100 ft. The capacity of the 18-deg. impeller

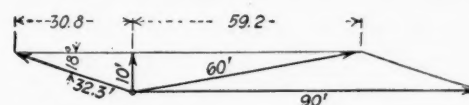


FIG. 6. DIAGRAM OF A 6-IN. IMPELLER

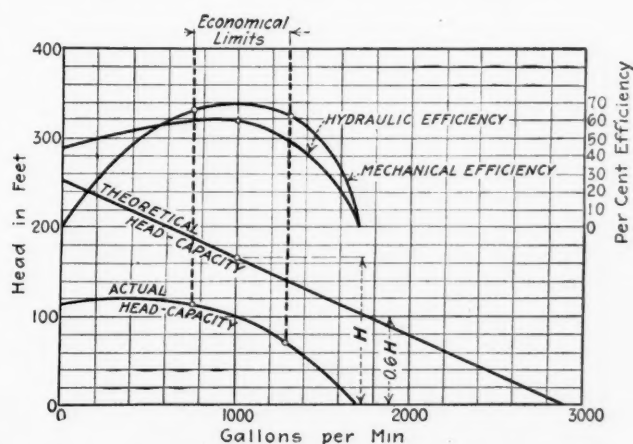


FIG. 7. CHARACTERISTIC CURVES OF 6-IN. IMPELLER

would be reduced to 800 g.p.m., whereas the 35-deg. impeller would cease to deliver water, as the maximum head which this impeller produces is 106 feet. (3) The horsepower curve, produced by the 18-deg. impeller, is flat and reaches a maximum near the condition point; whereas the corresponding curve, of the 35-deg. impeller, continues to climb after the condition point is passed. Should the head on the pump be diminished as through a break in the pipe line or when starting the pump with

the column pipe empty, the 18-deg. impeller would only slightly overload the motor, whereas the 35-deg. impeller would seriously overload it. Preference should therefore be given to impellers with small angles—that is, with strongly backward curved vanes.

Referring to Fig. 1,  $A$  represents the velocity and direction of the water as it leaves the impeller. This must be reduced and converted into pressure. Taking as an example the velocity diagram of the 6-in. pump shown in Fig. 6, the absolute velocity  $A$  is 60 ft. per sec. This velocity must be reduced to that in the 6-in. discharge pipe—that is, to 11.5 ft. per sec.—and this must be done gradually and with the least possible shock,

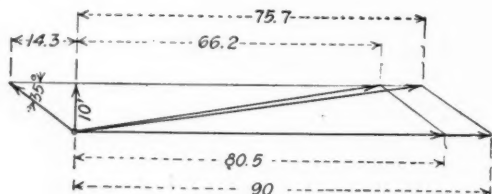


FIG. 8. EFFECT OF CHANGING IMPELLER ANGLE

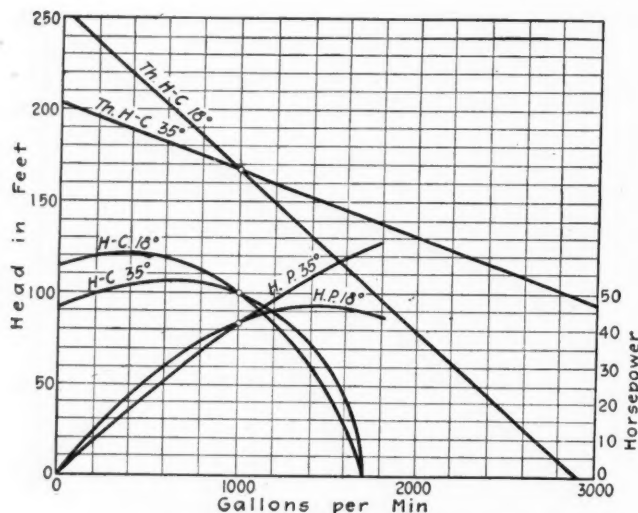


FIG. 9. CHARACTERISTIC CURVES OF TWO IMPELLERS

in order to avoid shock losses. There are two ways in which this can efficiently be accomplished:

1. By means of a volute casing, as in Fig. 1. The velocity of the water moving in the casing toward the discharge is lower than the absolute velocity  $A$ , and usually higher than the velocity in the discharge pipe. The shock and friction losses become a minimum for a certain ratio between the absolute velocity  $A$  and

the velocity of the water in the casing. At this ratio the pump works most efficiently. The efficiency decreases if an impeller is installed that would produce a different ratio. Referring to Fig. 7, the best efficiency occurred at a delivery of 1000 g.p.m. against a 100-ft. head. If it was desired to use this machine to pump only 500 g.p.m. against a 100-ft. head, the efficiency would decrease considerably even if a special impeller was designed and installed. The efficiency would remain constant, however, if  $V$  and  $A$  were changed in the same proportion as was the capacity—that is, in our case reduced by one-half. This would give the same ratio between the absolute velocity and the velocity in the casing. The head would decrease

as the square of the speed—that is as  $\left(\frac{45}{90}\right)^2 = \left(\frac{1}{2}\right)^2$

$= \frac{1}{4}$ , or to  $\frac{100}{4} = 25$  ft. Capacity head and efficiency

of a volute pump are therefore fixed and depend on the area of the casing. It will therefore in practice be quite often the case that the condition point does not coincide with the best efficiency point, as manufacturers limit the number of casing patterns to one or two for each size. To state, for instance, that a 6-in. volute pump has an economical capacity of 900 to 1200 g.p.m. for heads varying from 10 to 100 ft., is misleading. If the economical range at 100-ft. head lies between 900 and 1200 g.p.m., then it will fall at 10-ft. head to between 320 and 380 g.p.m.

2. The absolute velocity  $A$  is reduced and transformed into pressure by means of a diffusion ring, consisting of a number of diffusers, placed around the impeller (see Fig. 10). The diffusers are so designed that at the condition point the water discharged from the impeller at the velocity  $A$  enters them with the least possible shock. While passing through the diffusers, the velocity is gradually reduced to about the velocity in the discharge pipe. The area of the casing has not much influence on the efficiency as long as the passages do not obstruct the flow of the water. If therefore, as in the case cited above, the capacity of a 1000 g.p.m. pump is to be changed to 500 g.p.m., it is only necessary to design a new impeller and diffusion ring without changing the casing; and the same or approximately the same efficiency is obtained. The diffusion ring pump is therefore more flexible than the volute pump, but the latter is simpler, has fewer wearing parts and requires less expensive repairs. Diffusion rings do not improve the efficiency of low head pumps. Also, so-called "filling rings" for volute

TABLE I. DOUBLE-SUCTION VOLUTE PUMPS

Size, In.	Head in Ft.	50 Ft.	60 Ft.	70 Ft.	80 Ft.	90 Ft.	100 Ft.	Efficiency, Per Cent.
4	G. P. M.	350-500	380-550	420-600	450-630	475-660	500-700	55 to 65
	R. P. M. { 60 cycle 25 cycle	1,800-1,200 1,500	1,800-1,200 1,500	1,800-1,200 1,500	1,800-1,200 1,500	1,800-1,200 1,500	1,800-1,200 1,500	
5	G. P. M.	500-650	550-700	600-750	630-800	660-850	700-900	58 to 68
	R. P. M. { 60 cycle 25 cycle	1,200-900 1,500	1,200-900 1,500	1,200-900 1,500	1,200-900 1,500	1,200-900 1,500	1,200-900 1,500	
6	G. P. M.	650-900	700-1,000	750-1,050	800-1,150	850-1,200	900-1,250	60 to 70
	R. P. M. { 60 cycle 25 cycle	1,200-900 1,500	1,200-900 1,500	1,200-900 1,500	1,200-900 1,500	1,200-900 1,500	1,200-900 1,500	
8	G. P. M.	900-1,700	1,000-1,850	1,050-2,000	1,150-2,150	1,200-2,300	1,250-2,400	62 to 72
	R. P. M. { 60 cycle 25 cycle	1,200-900 1,500-750	1,200-900 1,500-750	1,200-900 1,500*	1,200-900 1,500*	1,200-900 1,500*	1,200-900 1,500*	
10	G. P. M.	1,700-2,400	1,850-2,700	2,000-2,900	2,150-3,100	2,300-3,250	2,400-3,500	64 to 73
	R. P. M. { 60 cycle 25 cycle	1,200-900 750	1,200-900 750	1,200-900 1,500*	1,200-900 1,500*	1,200-900 1,500*	1,200-900 1,500*	
12	G. P. M.	2,400-3,500	2,700-3,800	2,900-4,200	3,100-4,500	3,250-4,750	3,500-5,000	65 to 74
	R. P. M. { 60 cycle 25 cycle	900 750	900 750	900 750	1,200*	1,200*	1,200*	

\* These speeds are too high for bad water. Two-stage pumps will give better service.



TABLE II. HIGH-SUCTION MULTI-STAGE PUMPS

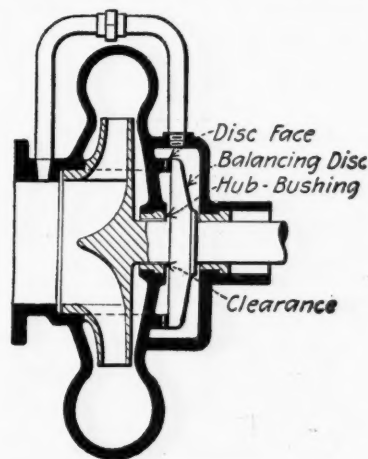
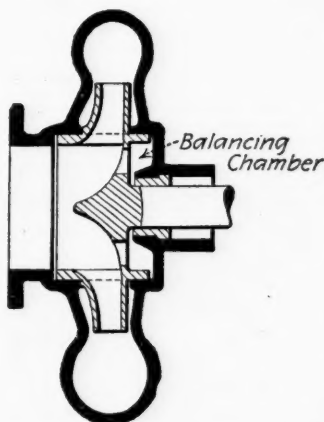
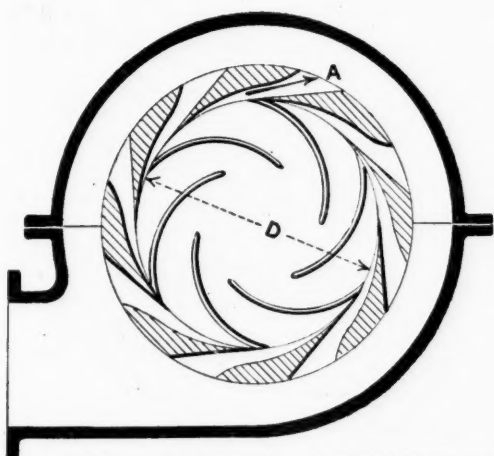
Size, In.	Head in Ft.	50 Ft.	60 Ft.	70 Ft.	80 Ft.	90 Ft.	100 Ft.	Efficiency, Per Cent.
4	G.P.M.	350-500	380-550	420-600	450-630	475-660	500-700	55 to 65
	R.P.M. { 60 cycle 25 cycle	1,800-1,200 1,500	1,800-1,200 1,500	1,800-1,200 1,500	1,800-1,200 1,500	1,800 1,500	1,800 1,500	
5	G.P.M.	500-650	550-700	600-750	630-800	660-850	700-900	58 to 68
	R.P.M. { 60 cycle 25 cycle	1,200-900 1,500	1,200 1,500	1,200 1,500	1,200 1,500	1,200 1,500	1,200 1,500	
6	G.P.M.	650-900	700-1,000	750-1,050	800-1,150	850-1,200	900-1,250	60 to 70
	R.P.M. { 60 cycle 25 cycle	1,200-900 1,500	1,200-900 1,500	1,200 1,500*	1,200 1,500*	1,200 1,500*	1,200 1,500*	
8	G.P.M.	900-1,700	1,000-1,850	1,050-2,000	1,150-2,150	1,200-2,300	1,250-2,400	62 to 72
	R.P.M. { 60 cycle 25 cycle	1,200-900 750	1,200-900 750	1,200-900 750	1,200-900 750	1,200-900 750	1,200-900 750	
10	G.P.M.	1,700-2,400	1,850-2,700	2,000-2,900	2,150-3,100	2,300-3,250	2,400-3,500	64 to 73
	R.P.M. { 60 cycle 25 cycle	900 750	900 750	900 750	900 750	900 750	900 750	
12	G.P.M.	2,400-3,500	2,700-3,800	2,900-4,200	3,100-4,500	3,250-4,750	3,500-5,000	65 to 74
	R.P.M. { 60 cycle 25 cycle	900-720 750	900-720 750	900-720 750	900-720 750	900-720 750	900-720 750	

\* These speeds are too high for bad water.

pumps fitted into the casing and surrounding the impeller, intended to minimize shock losses, should not be used in pumps handling acidulous water. They only add to the number of wearing parts and introduce troublesome joints in the casing.

A pump of the construction shown in Fig. 1 produces an axial thrust toward the suction inlet because the impeller areas exposed to the pressure within the pump

A single-suction impeller, as shown in Fig. 1, can be hydraulically balanced by providing a balancing chamber at the back of the impeller (see Fig. 11). Holes drilled through the back of the impeller connect this chamber with the suction inlet of the pump and the unbalanced area is thus eliminated. Single-suction volute pumps and multi-stage diffusion-ring pumps are mostly balanced in this manner. Volute pumps han-



FIGS. 10, 11 AND 12. ARRANGEMENT OF DIFFUSION RINGS AND METHODS OF HYDRAULIC BALANCING

casing are unequal, the area of the front being smaller than the area of the back of the impeller. The unbalanced area in Fig. 1 is  $\frac{\pi}{4}(7\frac{1}{2}^2 - 2^2) = 38$  sq.in. Assuming the pump to be working against a 100-ft. head, which is equal to  $\frac{100}{2.31} = 43.3$  lb. per sq.in., and assuming no pressure or vacuum on the suction, the axial thrust is  $38 \times 43.3 = 1650$  lb. If, as in a four-stage pump four impellers are mounted on a shaft in series, the combined thrust is  $4 \times 1650 = 6600$  lb. A heavy thrust bearing would be required to carry such a load and other means are usually employed to overcome it.

The elimination of the axial thrust "on paper" can be accomplished in several ways, but none gives absolute satisfaction in mine service. Excessive suction lift, particles of coal blocking the impeller passages, excessive wear of the internal parts, etc., may throw a pump out of balance and smash a number of the internal parts. Such accidents are costly and must be avoided. It is best to design a pump so that it is theoretically balanced and then add a good heavy marine-type thrust bearing for emergency.

ding water against heads exceeding 50 ft. are usually built with double-suction impellers. The water enters the impeller from both sides and no axial thrust is produced. The double inlet reduces the inlet area to one-half of the inlet area of a single-suction impeller. The wearing rings are therefore smaller in diameter and the leakage in a double-suction pump is consequently less and the efficiency higher.

Double-suction multi-stage pumps are not ordinarily used for mine service, as the casing becomes too large and expensive. A single-suction impeller can also be balanced by means of a balancing disk, fastened on the pump shaft and rotating in a chamber placed behind the impeller, as shown in Fig. 12. The disk divides this chamber into two compartments; one is supplied with water at the discharge pressure, the other is connected by means of a pipe to the suction inlet of the pump. The full discharge pressure acts therefore on one side of the disk, and the suction pressure on the other side, causing a thrust opposed to that set up by the impeller. If the diameter of the disk is made equal to the diameter of the impeller ring, the opposing forces are equal and balanced.

This device operates satisfactorily only if a constant



stream of water flows past the disk hub into the pressure compartment and past the disk faces back into the suction, preventing the disk from rubbing on the faceplate. The higher the pressure the higher will be the velocity of the escaping water; and it is obvious that acidulous water will soon destroy the disk hub and the disk faces.

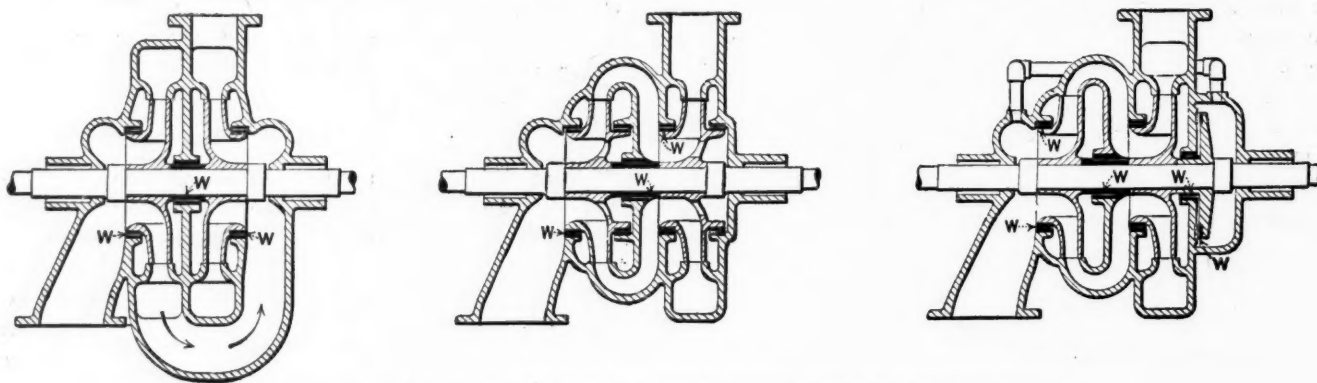
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The interior parts of a centrifugal pump that are most subject to wear are the impeller and casing wearing rings, the distance sleeves and bushings, the balancing disk (if one is used) and the shaft bushings. If the peripheral speed is kept below 90 ft. per sec., the wear of the impeller is small and a properly built diffusion ring outlasts two impellers.

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The efficiency of a centrifugal pump installation depends to a great extent on the layout of the pipe line. A poorly designed suction pipe may cause a considerable decrease in pump efficiency. The suction pipe should be as short as possible and absolutely tight; the lift, including friction, should for normal conditions not exceed 15 ft. A short elbow should never be attached directly to the suction inlet of the pump as the disturbances in the flow of the water produced by such an elbow may prevent a proper flow into the impeller and cause a considerable decrease in capacity



FIGS. 13, 14 AND 15. INTERNAL WEARING SURFACES OF VARIOUS PUMPS

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The designs shown in Figs. 11 and 12 are also used in multi-stage pumps. Figs. 14 and 15 show the arrangement of two-stage pumps, and in Fig. 13 is shown a two-stage pump of the "back-to-back" impeller type. The wearing parts are marked W, and the table below shows the number of these parts for each design:

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# Cost of Reaching the Market

Many Factors Besides Mining Costs Enter Into the Cost to the Consumer, and These Must Be Considered in Reporting on the Feasibility of Opening a New Mine if Financial Pitfalls Are To Be Avoided

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(a) Mining costs; (b) transportation costs and (c) disposal costs. It is mere repetition to state that coal-mining costs will vary, these variations being caused by such factors as underground conditions, management, labor, sup-

plies and finance. While all of these exert a more or less potent influence upon the cost of coal, and none may be forgotten in reporting on the possibilities of a coal property, they are all fairly well understood by mining engineers and will not be discussed in detail here.

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Transportation costs, except for those mines which are so fortunately situated that disposal of output takes place at the mine mouth, is a large item and one that demands a considerable amount of floating capital. It is self-evident that the extraction of coal is accomplished at a loss unless the item of reaching the point where sales can be consummated is taken into account at a figure which will permit of the disposal of the product at a profit.

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Transportation costs can be of two classes—carriage by rail based either on the ton or ton-mile, and sea carriage, generally based on the ton loaded. In the latter case it is usual to include cost of loading and unloading. With rail carriage the mine costs cover coal loaded into cars at the mine mouth, while the cost of discharging is commonly borne by the purchaser, who buys his coal delivered in cars at destination.

In sea carriage, however, in addition to the cost f.o.b. cars, there is the further cost of loading and trimming the vessel except in those few cases where the mine is so located that it can deliver its product direct into the holds of vessels without the use of cars. The unloading of coal cargoes, and more especially where large cargoes are being handled, is often done at the cost of the shipper, who, if his shipments are regular, maintains appliances and equipment at the unloading port to carry on this work. There are conditions, however, under which coal cargoes are consigned to

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The cost of track or spur accommodation and the car question are important items when considering rail transportation. Regulations, custom and necessity differ in various countries. Some governments will only permit spurs to be built to established stations, while some railway companies will permit connection to any intermediate point. Many railway lines prefer to build the connecting tracks themselves and charge the mining company with the cost of construction, while others leave that work entirely to the coal company with the exception of the first rail length and the connecting points to the main line. They then content themselves with an inspection during and after completion of the work. This may be either rigid or perfunctory.

Whatever the regulations may be, they should be ascertained from the office of the railway company before construction is commenced. Unfortunately, many mines have been started and in the end been left stranded for rail connections, either because the coal company assumed that the railway would provide the needed spur and afterward found the opposite to be the case, or because the coal company assumed that it had only a short line to build and later discovered that it had a considerable distance to cover to reach the nearest station point where connection would be permitted. Both cases are examples of careless investigation on the part of the coal examiners.

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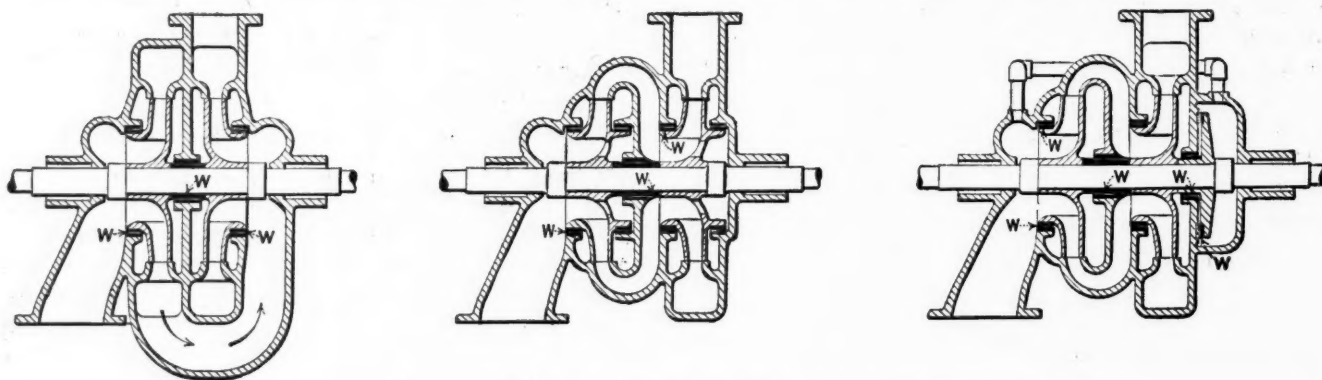
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cases only the railway company's cars are permitted to run over their lines and private ownership of rolling stock is forbidden. Box-cars have to satisfy the aspirations of many coal producers, and the loading of these cars always implies at least a small additional expense.

Railway car supply is a complex subject, and one that is difficult to diagnose. It is easy to imagine that a railway company would be glad of all the carrying traffic that it could obtain, but a few experiences of having to send the whole mine force home for several days will nullify this agreeable impression. It is infinitely better to appreciate these factors before commencement than to learn them from experience at a later date. Car shortage is an item in cost just as serious as a miscalculation in the amount of coal available or the capital required for operation.

Sea transportation may include loading, carriage and unloading costs. Loading is made up of three items—hauling the cars to the loading piers, storage at the piers and actual loading and trimming.

Hauling cars to the piers is railway work and may be done with standard rolling stock or by means of mine cars either of standard or of some narrower gage. The use of an intermediate-sized car and rolling stock is to be deplored, since although it is a system popular in some districts, it usually involves several extra handlings and breakages, and implies that a complete range of supplies and means for repair of another track gage must be maintained.

Commonly the distances from mine to sea are short, more especially in those cases where the lines and stock are privately owned or the property of the mine. Where such a trade is being carried on, as that from the Virginian fields, necessitating hauls of over 150 miles, the conditions are those of ordinary rail shipment.

#### MAY HAVE TO STORE COAL AT MINE

Storage at the piers may or may not be necessary. Where large tonnages are being mined and the vessels to be loaded are few in number, storage is often not required as the combined output of the mines more than meets the demands of the vessels. On the other hand, where the output is only moderate and a shipping trade has to be catered to, it is certain that storage either at the mine or at the piers will have to be undertaken. As vessels cannot afford to wait for cargo, and their arrival cannot always be predicted to the minute, practice has decreed that coal should be stored in pockets at the piers. This system makes vessel loading entirely independent of the mine.

Loading is influenced by the type of vessel, the hatch system and the method of discharging cars or loading from the coal pockets. Standard vessels being rare at present, there are in existence some strange but understandable anomalies in loading conditions. Coal handling and loading runs all the way in efficiency and all the way in method from a row of coolies with baskets, down to loading from a spout or a conveyor belt. Either of the latter systems are not as might perhaps be expected the most efficient at all times. There are cases where the cost of loading by the day wage, by hand and head and basket, is less than the interest which would have to be paid on the cost of a large and modern coaling plant.

Passenger vessels built for tropical voyages have often only small and awkwardly placed coaling hatches, designed for hand loading. The bunkering of one of these steamers becomes a long, slow, tedious operation at a modern coaling pier.

On the other hand, extremely rapid loading is possible where equipment has been standardized and a suitable class of vessel is employed. Hopper-bottom cars of large capacity delivering direct into bins or into chutes is naturally the most direct and quickest loading. With soft coal the breakage is excessive, and so various additional appliances are in use to overcome this defect. Questions of space and storage may, however, bring about the use of some of the other forms of loading appliances, but whatever be the method it should be as direct as possible and eliminate excessive handling of the coal from cars to hold, so that breakage can be avoided and speed attained.

#### UNNECESSARY HANDLING OF COAL

Some systems and some concerns have so neglected these simple rules that the coal is sometimes handled no less than seven times before it reaches the boat. Conditions approximating these are more pronounced where coaling piers are not built separate from ordinary cargo docks, and where the coal is run onto the docks at water level.

Trimming is undertaken in order that the vessel may steam properly and be well stowed in cargo space. Trimming costs vary according to the wage scale paid, the labor available, the type of vessel and the tonnage of the boat to be loaded. Each port and each coaling company generally has its own scale of charges. In the case of publicly administered harbors this can be readily ascertained from the office of the harbor commissioners. Coal companies handling their own coal, or railway companies operating the coaling piers, also have a scale of charges for vessels requiring bunker, while they employ their own trimmers and pay them on contract or day wage, charging the shippers of the coal so much per ton or agreeing to handle the coal from the mine into the vessel's hold.

Sea transportation costs vary according to the tonnage carried, the length of the voyage and the time extension of the charter. Naturally, in freights as in everything else, it pays to move, within limits, large tonnages at one time; and when this is combined with a certain continuity of contract freight costs are at their minimum. It is also an axiom that it costs relatively more to move a cargo a short distance than it does to carry it a long distance. That is, one long voyage is preferable to several short ones. Since also a coal cargo can only be carried in the outward direction, it becomes a desideratum on the part of the boat owner to provide some form of return cargo or face a loss. The ease with which a return cargo can be arranged at certain ports is also a factor in reducing costs.

Coal-carrying companies who mine and ship their own coal and find their own vessels commonly do not trouble about return cargoes. To them the handling of the coal is a necessary part of the expenses, and as such has to be met and paid for irrespective of whether or not the boat is usefully employed both going and coming. This is a parallel on the sea to having to send coal cars back to the mine empty on land.



The time during which the charter or lease of the vessel runs has also an influence in the cost of carriage. Naturally the steamship owner, like the landlord, likes a steady tenant and is prepared to make some sacrifice on the chance of having his vessels usefully employed over long periods. The date at which these charters are drawn up, unless special provision is made therefor, is an important point in the ultimate economy. If consummated during a period of high freight rates and carried forward over a longer succeeding period of low rates such a charter may be a godsend to the owner of the vessel but a poor speculation on the part of the coal shipper. The reverse would be the case with a charter made in a period of low freight rates.

Coal unloading may include the handling of the coal from the vessel's hold to the dock and thereafter a screening operation to prepare it for sale. This latter handling might also be termed a disposal cost.

Unloading is carried out by means and systems ranging all the way from primitive to modern. Undoubtedly the quickest, and therefore the most economical under average conditions, is the grab-bucket system, which may be used where the vessel has been designed with large and unobstructed hatchways. The unloading of any vessel should not have to wait on the disposal of the coal, and therefore either a storage space should be provided on the dock or unloading done direct into railway cars. The processes generally are the reverse of the loading at the coaling piers.

#### ADDITIONAL ITEMS ENTERING INTO COST

In certain countries and in certain harbors, mainly those wherein the coal companies or the railway companies do not own or operate their own equipment, there are a number of smaller charge items which have to be paid before all the costs have been included. These are dock and harbor dues, towage, tug and wharfing charges. These may run as high as 20c. per ton and are payable mainly on the tonnage of the boat and on the services required. These items have to be reckoned with if an estimate is being made of the cost of handling the coal to an export market overseas.

Disposal costs are mainly office charges, but may in certain cases include a cartage and retail handling of the coal and maintenance of the necessary equipment. Mainly this work is carried out by retail firms who will contract with the importing company for so much tonnage per annum. Under these circumstances disposal charges are salaries to salesmen, the office staff employed and similar items. This work may even cover office and dock rent and provision and operation of a screening plant on the dock, necessitating the disposal of the small coal produced. In such cases the costs approximate and can be reckoned on the basis of similar charges at the mine itself, provided attention is paid to any differences in labor conditions and other factors which may govern the situation, where the screening or mining operations take place in one land and the unloading and screening in another.

To sum up then, the cost of reaching the market in most cases is by no means covered by the cost of mining. It may embrace many items of expense not ordinarily encountered, but none of which may be neglected in the engineer's report if the owners or lessees of the mine are to avoid financial errors.

## Minecdotes

### The Story of the Blind Miner

"I have never told this story yet," said the mine boss, "but what some doubting Thomas didn't say I ought to be elected a full-fledged member of the Ananias Union—or words to that effect. But I can vouch for it being the truth.

"When I took the job some years ago as assistant foreman at the ——— mine, they had a fellow working there as a miner who was completely blind. 'Old Johnny,' the men used to call him. He was a prime favorite with everybody, and in spite of his affliction was one of the best miners in the mine. He had been working there for years, and it was positively uncanny, at least to a newcomer, to see the way he could sense his way around.

"Now it happened that a short time after I arrived we ran into a gas pocket in one of the main headings, and to make a connection to air it was necessary to drive a crosscut 60 ft. to the airway. The place was making gas worse than anything I have ever seen before or since. It blew out of a fissure in the rib, under pressure, and you could hear it wheezing 200 ft. before you got to the face.

"We ran compressed air to the face as well as a brattice, but even at that it was impossible to raise a safety lamp over 2 ft. from the bottom without the gas snuffing it out. Naturally, nobody wanted to work in there, and to tell the truth I didn't blame any miner for steering clear of it. Just to hear the gas stewing out of the hole was enough to give anybody the creeps, let alone seeing a gas cap in your lamp as big as it would hold.

"Finally the superintendent offered double wages for any man who would work it, with no takers, until Old Johnny happened to hear of it. He grabbed it at once and went to work in there by himself. Now you can believe me or not, but in due time he made the connection with the airway so that it was possible to get good ventilation and continue the heading as before.

"It was easy meat for him, as the problem of a light didn't bother him any; and in that particular case the fact that he was blind enabled him to make a good piece of money for himself and at the same time enabled the company to get through the pocket of gas in perfect safety."

A rather heavy silence ensued after the mine boss concluded, which was finally broken by the master mechanic.

"If nobody offers any objection," he said, drily, "I would like to make it unanimous that the gentleman be made a *life member*."

[*Coal Age* will pay liberally for short, witty stories suitable for publication in this column, provided the tales are of the mine and have the proper coal-mining "flavor." If they point a moral, so much the better. Dig down into your experiences and share with the many readers of this journal the humorous incidents you have witnessed in your duties around the mine.]



# Successful Burning of Anthracite Slush

**SYNOPSIS**—*Anthracite slush, or the fine material made in preparation that passes through a  $\frac{3}{32}$ -in. circular opening, has never been considered of commercial value except for the manufacture of briquets. However, this material is now being successfully burned by means of a chain-grate stoker and forced draft.*

**P**ROBABLY every great industry has its waste-utilization of waste-disposal problem. Some, such as meat-packing as an illustration, have solved their difficulties in this direction, and little if any material is rejected or thrown away as entirely useless and unusable.

The coal industry, as well as the others, has had its waste problem. This has lain in the disposal of two products—the slate brought out of the mine with the coal and later separated from it in the process of preparation, and the fine coal produced, for which no commercial demand as yet exists.

Slate and bone are at present disposed of in various ways, one of the most effectual being the pulverization of this material and its flushing back into the old workings to insure surface support. For bituminous slack there exists at the present time a strong demand. In the past, however, considerable quantities of this material have been dumped on the ground and wasted at no small cost to the mine because there was no market for this fine material.

The sizes of anthracite that have been deemed usable have almost steadily grown smaller since the beginning of the industry. At present the only size of this material made which is not considered burnable in ordinary furnaces equipped for steam generation is what is va-

riously known as culm, silt or slush. This is the size that passes through a  $\frac{3}{32}$ -in. circular opening, the actual size of the various particles ranging from minute dust to the full-sized opening referred to above.

Because of the variation in size of the individual particles the interstitial openings are numerous but minute, and the passages through which air may travel in traversing a bed of any considerable thickness of this coal, as that upon a fire grate, are small and tortuous. The percentage of voids in a bed of this fuel is probably about the same as that in a mixture of fine gravel and sand.

The difficulty encountered in the burning of this fuel by ordinary hand-firing methods in boiler furnaces has been the deadening effect of a fresh charge of coal upon a going fire. This arises chiefly from the small air passages previously referred to. Ordinary natural draft, unless caused from a prohibitively high stack, is inadequate to force air through any considerable thickness of this fuel, and as a result where this material is to be burned commercially forced draft must be installed.

The coal department of the Delaware, Lackawanna & Western Railroad Co., at its Nanticoke power plant, is successfully burning this fuel under boilers, thus utilizing a product which has heretofore been considered useless except for the manufacture of anthracite briquets.

The fuel used in this particular power plant is made at the washery operated in connection with the Loomis breaker of the above-named company. The slush, or silt, which passes through the smallest opening of the shaker screens drops into a shallow hoppers tank under the shakers. While being treated on the shakers the coal is subjected to water sprays, and this water of course finds its way through the screen plates and enters the hopper-shaped tank referred to, along with the coal passing the small mesh.

At the bottom of the hopper-shaped concrete tank below the shaking screen the fine coal and a certain portion of the water is drawn off through an ordinary gate valve into a chute below. The greater portion of the water is, however, drawn from this tank at a point considerably above the apex of the hopper, so that little, if any, coal goes off with the bulk of the water. The chute into which the silt and water are discharged from the bottom of the tank leads to a storage bin exactly similar to the bins for storing the other grades of coal. At suitable intervals—that is, when a sufficient amount of this slush has accumulated in the storage bins—it is drawn off through regular chutes into a hopper-bottomed railroad car.

Of course, throughout this entire process, or until after the coal has been deposited in the railroad car, all of the voids between particles have been thoroughly filled, or a little more than filled, with water. This may be clearly seen in Fig. 1, which shows a car under the loading chute almost full of this fine coal. When a car of this material leaves the washery, while the coal is heaped up somewhat above the level of the top of the car, the water is overflowing the sides.

In passing the valve and traveling down the chute, and particularly in flowing from the bin to the car

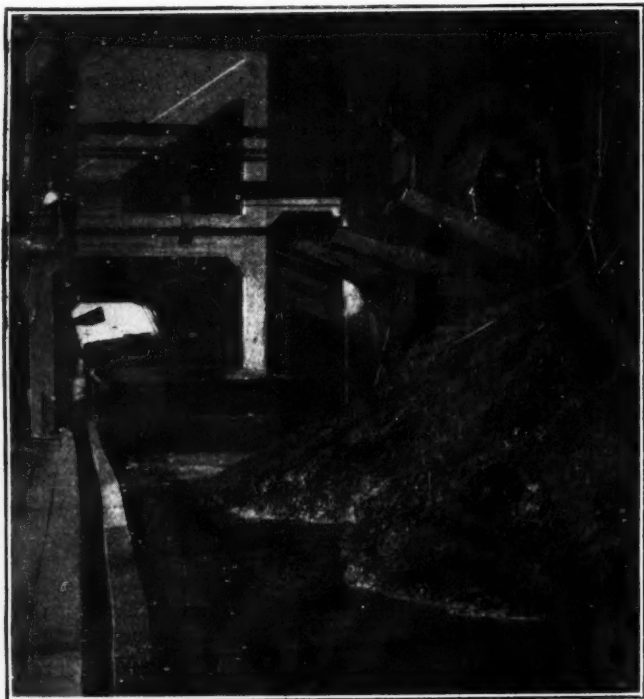


FIG. 1. CAR OF SILT UNDER THE LOADING CHUTE. NOTE THE LARGE AMOUNT OF WATER

through the loading chute, this mixture of fine coal and water behaves much like a thick or viscous liquid. At a short distance away the material in the car more resembles mud than it does coal.

So nearly liquid and so thoroughly flowable is this material when it enters the car, that it is necessary, before running the car under the loading chute from the slush or silt bin, to place in its bottom a few hundred pounds of coal of the next larger size in order to prevent the fine material from flowing out of the cracks around the hopper-bottom doors and thus being wasted.

In this condition it is run upon the coal tracks of the Nanticoke power plant. These tracks enter the boiler house at one end and extend throughout the length of the building immediately above the coal-storage bunkers. The coal is here discharged from the hopper-bottomed cars and passes down into the bunkers through a cast-iron grating containing openings about  $2\frac{3}{4}$  x  $3\frac{3}{4}$  in. From the bottom of the coal bunkers chutes lead to the feed hoppers of Coxie chain-grate stokers.

The fingers (or as they are familiarly known the "piano keys") of these stokers, which form the actual coal-supporting surface or grate, are of special design and contain openings about  $\frac{1}{8}$  in. wide and  $\frac{3}{8}$  in. in length. Approximately 6 per cent. of the grate surface is made up of these minute air spaces. On the grate of this stoker this fine material, which is carried to a depth of about 4 in., is burned by the aid of forced draft of an intensity of about  $1\frac{1}{2}$  to 2 in. of water. Considerable care and no small amount of skill must be exercised in handling this fire.

The fire carried in these stokers is by no means as flexible as it is possible to secure with some types of stokers and bituminous coal. The heat developed, however, is intense, as may be judged from Fig. 4. This is, by the way, a peculiar and in some respects a remarkable photograph. It was taken through the side door of the furnace and shows clearly not only the fire bed with the flame leaping up through it, the minute air holes blown in the fire at points above the tuyere openings

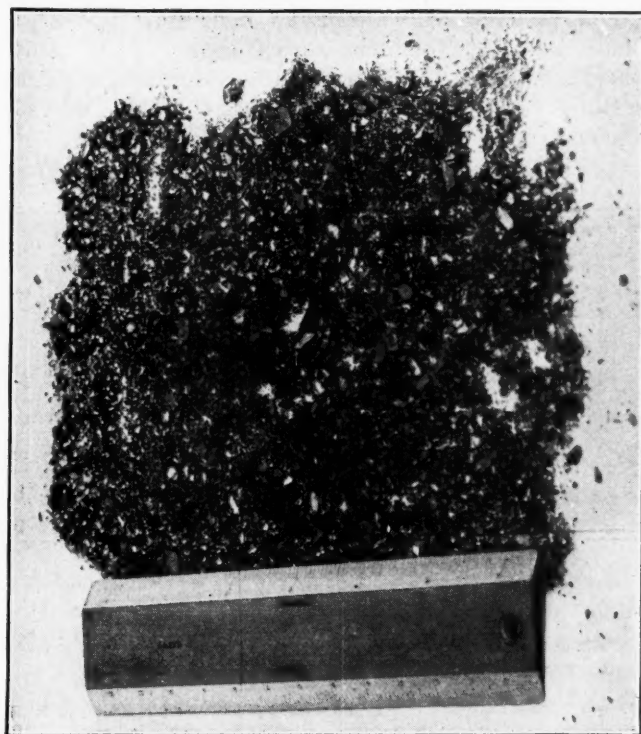


FIG. 2. THE SILT IN COMPARISON WITH A 6-IN. RULE

of the grate, but also the effect of the intense heat developed upon the side walls and setting of the boiler. This is evidenced by the slag formations on the side of the door opening, which somewhat resemble icicles in form and shape.

In this plant at the present time 10 Babcock & Wilcox boilers, each of 303 hp., are now in operation. These are set in batteries of two each. The actual effective grate surface under each boiler is 10 ft. wide and 11 ft. 8 in. long. Four more boilers, duplicates of the ones now in operation (except as to superheaters), are now being installed in the plant. Steam is carried at 155 lb. pressure and 150 deg. of superheat. From the boiler plant the steam is conveyed to the

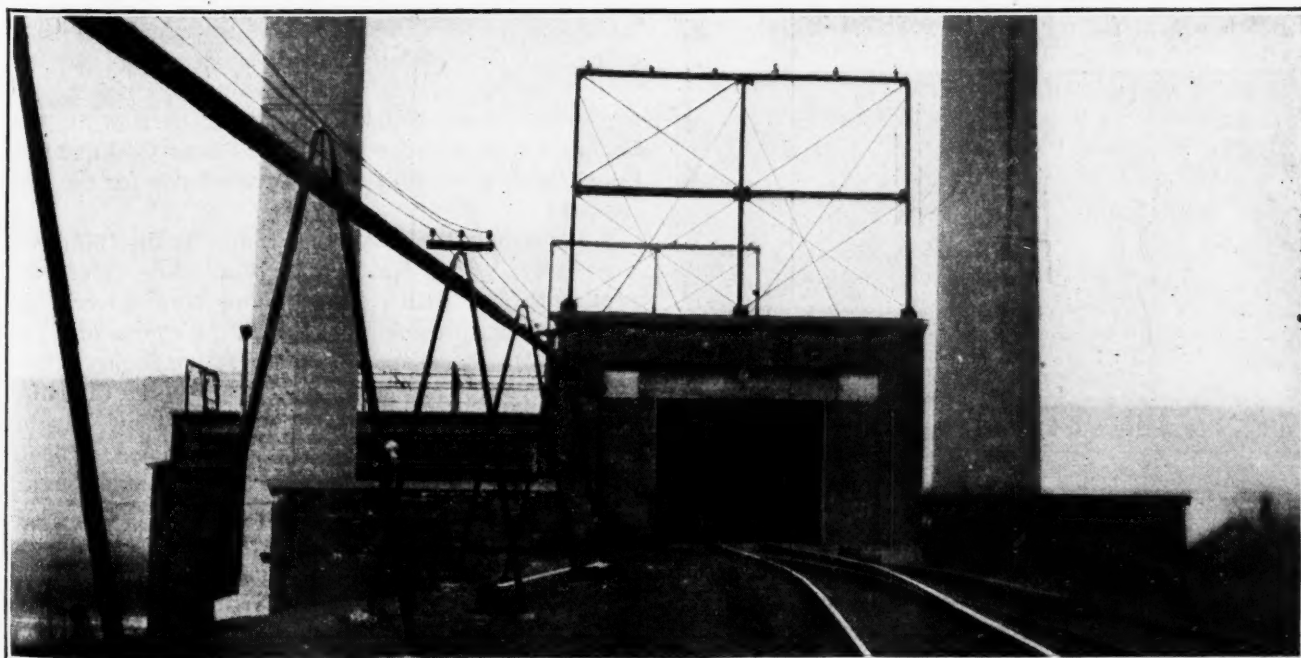


FIG. 3. UPPER END OF BOILER PLANT SHOWING CARS ON FUEL TRACK ABOVE BOILER BUNKERS



engine room, which contains as main units two Allis-Chalmers steam turbines direct connected to Allis-Chalmers 4100-volt, 565-amp., three-phase, 60-cycle generators. These machines operate at 1800 r.p.m. Surface condensers are employed and a vacuum of about 28 in. is secured. Cooling water is drawn from the Susque-

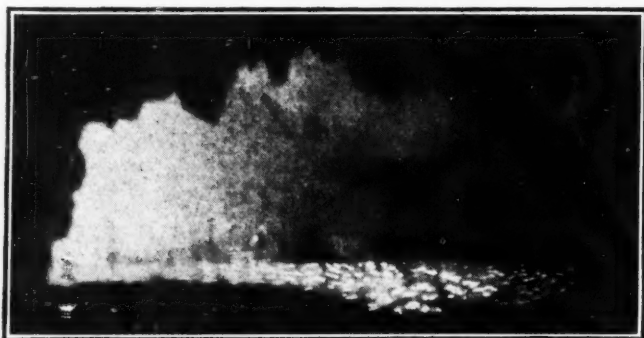


FIG. 4. INTERIOR OF THE BOILER FURNACE. THE CHAIN GRATE MOVES FROM RIGHT TO LEFT

hanra River and returns to the same source, the power plant being built upon the bank of this stream. The power generated is transmitted direct without transformation to eight different collieries of the Lackawanna company.

At this and other Lackawanna plants, so far as is known, have been made the only successful attempts to burn an anthracite fuel as fine as that used. The size of the individual pieces of coal may be clearly judged from Fig. 2, which shows this fuel in comparison with a 6-in. ruler. As may be clearly perceived in this photograph, some pieces of the larger sized coal employed to keep the fine stuff from running out of the cracks around the door of the car have been included in the sample photographed. The balance of the sample shows clearly, however, the small size of even the largest particles and gives a clear idea to those familiar with combustion problems of the difficulties in any scheme for the utilization of this product.

This fine material contains from 85 to 90 per cent. as much heat per pound as does the larger grades. The question which has confronted would-be users of this

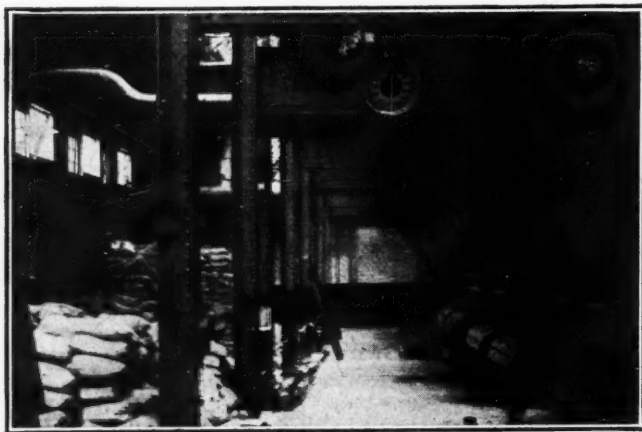


FIG. 5. VIEW DOWN THE FIRING ALLEY OF THE BOILER PLANT

fuel has always been how to get the heat out of this fine coal. It would appear that the chain-grate stoker and forced draft as employed in the Nanticoke power plant have proved a successful solution to this problem.

## Who's Who In Coal Mining

### W. J. Heatherman

Character, integrity and ability are so plainly stamped on the countenance of W. J. Heatherman, who was recently appointed by Governor John J. Cornwell as chief of the West Virginia Department of Mines, that his face may be said to be one of his best assets. Mr. Heatherman, in reaching his present position, has had no easy road to travel. The standing he has achieved in the mining world is due to no accident, but to his own ambition and perseverance, coupled with a most delightful personality which at once attracts people to him and which undoubtedly had much to do with bringing to him the invitation to accept the post which he now holds.

W. J. Heatherman was born at Malden, W. Va., three days before Christmas, 1884. He is therefore not quite 34 years of age. What education the new mine chief has received has been gained at times which he could spare from work in the mines. The foundation for his technical education was laid in the public schools of West Virginia, supplemented by two years spent at Mount St. Josephs College, Baltimore, and a two years' course in mining engineering at the Ohio State University, where Mr. Heatherman was an instructor in surveying.

Most of his education, however, was gained after he had begun work in the mines. He started in as a trapper boy at the age of twelve, at Powhatan, working for the Powhatan Coal and Coke Co., operated then as now, by Col. L. E. Tierney. Having become interested in the technical phases of mining and desiring to learn all there was to know about the profession, young Heatherman accepted a position as chairman on the engineering corps of the Powhatan company. Observant of the ambitions of young Heatherman, Colonel Tierney presented him, as a Christmas present, with a correspondence course in mining engineering in the International Correspondence School. Equipped partially with an education as a mining engineer gained through a correspondence course, young Heatherman in 1900 became a mine boss for the United States Coal and Coke Co. at Gary, later being made a transitman for the same company.

After completing a two-year course at the Ohio State University, young Heatherman was made chief engineer with the Beury interests on New River. His ability was soon recognized, and in the course of a year or so he was made superintendent of the Stuart Mining Co. at Fayette. Attracted by his ability, the Clinchfield Coal Corporation tendered the young West Virginia mining engineer a position as superintendent of one of its mines in the Big Stone Gap section, Mr. Heatherman remaining with that concern for several years, acting as superintendent of several of its mines.

Another chapter in the career of W. J. Heatherman was written when he became general superintendent of the Main Island Creek Coal Co. in Logan County, continuing in that capacity until he branched out for himself during the last year, at the same time managing



the operations of the Maxine Coal Co., whose headquarters are at Huntington.

The new chief of the Department of Mines is an enthusiastic advocate of safety-first in all its phases. His slogan is not only "First Aid to the Injured," but "First Aid to the Uninjured"; and this forms the burden of his first communication addressed to the operators, mine officials and miners, made after he assumed charge of the West Virginia Department of Mines. One of the first things with which he was deeply impressed when he assumed the office of chief of the Department of Mines was the number of fatal accidents occurring in the mines in this state, a number which is greatly in excess of what he deems it should be.

He has publicly stated that he desires and solicits the coöperation of the operators, mine officials and miners in everything that will assist in placing the mines of the state on a higher standard of safety and efficiency.

Two teams of miners drilled by Mr. Heatherman during his connection with the Clinchfield Coal Corpora-

he was then engaged in the coal-mining business as an independent operator; and therefore it was with much reluctance that those with whom he was associated consented to release him in order that the state might have the benefit of his services.

Mr. Heatherman and Miss Alice Smith, of Chillicothe, Ohio, were united in marriage in 1908, and have two splendid boys aged nine and seven respectively.

From remarks made by members of the staff of district inspectors of the Mine Department following the first conference held by the new chief, it is believed that he will not only command their confidence, but that of all others with whom he comes in contact.

### Open Air Accidents with Explosives

Three accidents within a week, due to explosives, recently occurred in eastern Pennsylvania. All took place out of doors.

In the first accident a large number of drill holes were being charged with 20,000 lb. of dynamite. The work was being done by an expert blaster sent out by the company furnishing the explosive. In some unaccountable manner the blaster detonated the charge in one of the holes and was instantly killed. Although the exact cause of this accident will never be known, it is believed that a portion of the charge became wedged in the hole and, in attempting to dislodge it, the blaster set off this sensitive explosive with his tamping stick.

In anthracite stripping it is the practice to keep the holes a short distance ahead of the shovel and never to charge a hole with black powder while the shovel is digging. As a further precaution, when black powder loading is going on with a shovel in the proximity of the hole, even though the shovel is at rest the smoke-stack is hooded to prevent the emission of sparks.

In the second accident a series of holes had been drilled, and the foreman gave the blaster instructions to wait until after quitting time before starting to charge them. The foreman then left to attend to other duties, whereupon the blaster and his two assistants began to load the holes.

While the blaster was pouring black powder from a keg into one of the holes, a spark from a shovel that was digging nearby ignited the explosive. Every bit of clothing was burned off the man, and only a small portion of his body escaped serious burns. It is thought that he may survive, but this is considered doubtful. His two helpers received serious burns about the hands and face.

Heavy rains have prevailed during the past month, and after one of these several holes were loaded directly in front of a shovel. The dynamite used was of about 60 per cent. strength. After the holes had been fired, the shovel was moved up and work commenced. Only a few dipperfuls had been taken, however, when the engineer collapsed.

Upon examination it was found that this man had been "knocked out" by the dynamite fumes, the effects of which are well known. The morning was a "heavy" one, and the gases seemed to drift to a point directly under the shovel cab. Thus, while this man was practically working in the open air, he evidently received the full effects of the dynamite fumes.



W. J. HEATHERMAN  
Chief of the West Virginia Department of Mines

tion won the trophies awarded the best first-aid teams during the Virginia State Meet at Big Stone Gap in the years 1915 and 1916.

The new mine chief's favorite recreation is baseball, and not only baseball as seen from the bleachers or grand stand, but as seen from the diamond. He has played baseball since he was a youngster, and played so well that he could have secured a berth in the Three-I League and leagues of similar classification had he so desired, excelling as a first baseman.

When J. H. Murray and others of Huntington contemplated the expansion of operations of the Maxine Coal Co., they felt no hesitancy in investing additional capital to be expended in improvements so long as they knew W. J. Heatherman was to be in charge of such improvements and subsequent operations, even though

# Tenth Annual Convention of the International Railway Fuel Association

**T**O STIMULATE greater effort on the part of all concerned in the production and use of coal, the International Railway Fuel Association, composed of the officials of American and Canadian railway fuel departments, in conjunction with coal operators, recently tendered its services to the Government. The offer was accepted by the Fuel Administration and the Railroad Administration, and these two Government departments, in cooperation with the officers of the Fuel Association, arranged for the convention held on May

23 and 24 in Chicago. The speakers who addressed this meeting are all men of national prominence, whose previous experience or present contact with the fuel situation enabled them to speak with authority to mine operators, mine workers, railway officials and railway employees. Special emphasis was placed by most of the speakers on the value of individual effort in connection with coal conservation, as will be evident from a reading of the several inspiring and excellent papers abstracted on the following pages.

## Fuel Problem As It Relates to War Activities

BY P. B. NOYES

Director, Conservation Division, United States Fuel Administration

**F**OR nearly nine months the Fuel Administration has been rounding up, as it were, the factors of a problem absolutely new in the industrial life of America. The picture is now complete. The governing factors are before us. Their relations and inter-relations have been clearly determined. The solution, however, of the war fuel problem is a task quite beyond the power of any administration or administrator. It lies in the hands of a thousand agencies and millions of men.

The coal supply is short. Last winter it was short, and the immense new requirements for war purposes threaten to make it shorter still the coming winter. The mines, which must get out the coal, and the railroads, which must carry it, were pressed nearly to their limit before the war. They cannot take on 200,000,000 tons of additional production. Add to this the tremendous burden of war supplies, troop transportation, material for shipbuilding, and food for our Allies, and then picture to yourself what it means to the railways, with facilities little if any greater than three years ago, to provide transportation for 200,000,000 additional tons of coal.

Conceive of this increase as 16 solid trains of gondola cars filling 16 tracks from New York to San Francisco—a veritable freight yard filled with coal cars extending the breadth of this continent. And this represents only the increase of coal transportation demanded of the railroads. All of those four million cars must be switched in and out and carried hundreds of miles by our already burdened transportation system if war demands are to be met and the usual industrial life of the country be at all preserved.

The coal business is in physical proportions so far beyond any other business in the country that emergency remedies which can be successfully applied to any of the others will hardly make a dent in the coal shortage.

And yet, the success of the war is likely to depend just on this supply of coal. Coal to manufacture supplies and ammunition on a greater scale than Germany, and coal to transport these supplies and transport millions of men both in this country and across to Europe, is the first essential of our success. Behind this we have the necessity for coal to maintain life at home, to preserve our economic system and keep our ordinary industries running and keep labor employed.

There has been much talk of shutting down "nonessential" industries, but a little investigation shows that only a short distance down this road lies financial ruin and unemployment of labor on a scale which would bring disaster at home and failure in war.

We are apt to forget that what are now called the nonessential industries are the absolutely essential industries of peace times. They are more than that—they are, even in war times, the essential means for life and happiness to a very large portion of our population. At least 20 billion dollars of capital is invested in legitimate manufacturing enterprises producing goods not strictly needed for the war. Ten million men support their families from the work they do in these factories.

Whenever war industries are threatened with a coal shortage, unthinking people light-heartedly suggest the cutting off of nonessential industries. Last fall lists were repeatedly suggested by responsible people for the cutting off of certain industries as nonessential. It only required a cursory examination of this list of industries to find that they involved the happiness of a tremendous proportion of our working population; that cutting off their fuel supply meant bankruptcy on a scale which would precipitate the greatest panic ever seen in the United States, and the sudden and forcible unemployment of at least five million men. It was thought by some a sufficient answer to suggest the need of men for

war work. But the shifting of workmen from one business to another is a difficult and slow process. We know that a majority of the workmen thrown out by such a sudden shutdown of industry would not get employment. Such readjustment of employment would affect only a small faction of the workers. A large proportion of the employees in every factory are not migratory. They own homes. They have lived in the same place all their lives. They starve there rather than move. They do not know where to go for work even if they are willing, and no power on earth could arrange new places for five million men in time to prevent not only hardship and misery but possibly riots and bloodshed.

All responsible agents of the Government now realize that keeping labor reasonably employed and only taking it away from nonwar work as fast as it can be employed on war work, is nearly as important for success in this war as the manufacture of munitions and ships. Granted that we must have 100 per cent. fuel for munitions and ships. We shall fail as a nation if we do not provide this without a complete breakdown of our industrial system.

Fuel is a small part of the raw material of most manufacturing institutions. The fuel expense in most highly organized industries is little over 1 per cent. of the total cost of the goods. On the other hand, this 1 per cent. is absolutely vital. Without it the factory closes. The other 99 per cent. are useless. We are called upon to view a ton of coal as equal to 500 or 600 lb. of ship plates or shells, but every ton of coal saved for our factories means the employment or nonemployment of a hundred men.

Over and beyond the desperate need of coal for war purposes lies an equally desperate need of coal to preserve the lives and happiness of the population. The threatened shortage of coal can easily mean unemployment and financial ruin.



Every extra ton of coal taken out of the mines is likely to keep a hundred extra workmen from idleness. Railway locomotives burn more than a quarter of all the coal mined in the country, and it lies in the power of the railway fireman and the organization with which he works to save enough coal to turn threatened national disaster into national prosperity.

Fuel economy on a scale which will really save the country from industrial disaster demands first, a study of methods and, second, a willingness to take pains. It has rightly been said that if every man who burns coal will do the very best he knows how without a word

of new information, the saving effected will result in plenty of coal for every purpose. Under the present stimulus, I credit every one with giving more attention to economy than ever before, but this matter of doing one's best is relative. It is proportioned to the background of necessity which lies in our minds.

Few men ever reach 100 per cent. of their possible efficiency. Most of us never reach 50 per cent. Any man who through enthusiasm or other stimulus gets up to 75 per cent. of his possible efficiency is a brilliant success in his field of endeavor. The only man I can think of who is up to 100 per cent. of his

possible efficiency is the drowning man. His "background" is sufficient to bring out all there is in him.

The background of this terrible war is raising the efficiency of every man and woman in the United States. It is raising it in proportion to the desperate character of that background. Those to whom war has not yet appealed as vitally affecting their lives, have little increased efficiency. The more the meaning of the war has come home to us, the more we have approached our possible efficiency. This is a real force and should be applied directly to fuel economy. Only in that direction lies success in winning the war.

## What the Coal Operator Can Do To Help Win the War

BY HARRY N. TAYLOR

Vice President, Central Coal and Coke Co., Kansas City, Mo.

**T**HREE great factors make up the fuel problem, any one of which can render helpless the other two. These are the producer, the transporter and the consumer. The producer may be ready to ship the coal and the consumer be ready to take it; but if the transportation is lacking, the other two are helpless. The railroads act in a dual capacity in relation to the fuel situation—they are both transporters and consumers. But viewing them from their primary standpoint—transporters—I believe no body of men is more alive to the importance of the great work before it, or will more patriotically perform its duties than the great industrial army of railroad men.

The coal operator is passing through the most extraordinary period in the history of his industry. He is confronted with the task of supplying an ever-increasing demand, while the means at his command are being constantly curtailed and production threatened. His men are being enlisted or drafted into the army, his machinery is wearing out, and to secure new machinery is next to impossible.

His allies—the railroads—are also being called upon to move an extraordinary tonnage created by war demand. This taxes them beyond their power of performance. This necessarily hampers the coal operator, through lack of motive power and shortage of car supply. We are all confronted by a great task, calling for determination and courage if it is to be successfully overcome. Every one of us must first think, then plan, then do, and the do must be spelled with a capital "D."

I have been connected with the coal industry for more than 30 years, and past experience teaches me that the coal man is at his best in times of stress. Trouble does not discourage, but spurs him on to greater effort. In the many lean years of the past, most coal men have had so little profit in their business that they have been forced to meet many emergencies, and they have become adept at turning corners when harassed by adverse conditions. Thus for years we have been meeting diffi-

culties which would have tried the courage of any man; but this very condition of the industry has fitted the coal operator for the great task that now confronts him.

The railroads have had in the past five or six years a situation very similar to that of the coal operator. With constantly increasing costs of labor, material and supplies, with no means at their command to increase revenue to meet the demands made upon them, they have fought manfully against these adverse conditions and have done wonders with the resources at their disposal. Now that the extraordinary demands of the war are forced upon them, they are compelled to face difficulties seemingly insurmountable.

### ROADS FORCED INTO BANKRUPTCY

In the past few years many roads have been forced into actual bankruptcy, while others made heavy drafts on surplus earned to provide motive power and cars to meet emergencies. For years the big shippers of coal have done all they could to aid the railroads, in securing permission to increase rates, and thus to provide means for adequate motive power and cars to properly conduct their business. This was done, not because the coal men are philanthropists, but because they realized that unless an increase was secured they would pay far more dearly for enforced idle time at their mines arising from lack of adequate car supply than the amount they would pay through a reasonable advance in rates.

The demands of the public for coal supply now requires steady and full running time at all mines, six days per week, every week in the year.

As yet only a comparatively few people have realized the great responsibility resting on the vast consuming public, if the threatened shortage in coal supply is to be overcome.

Although the figures available at Washington show that 550,000,000 tons of bituminous coal was produced in the year 1917, still the country faced an actual coal famine. Every railroad, manufacturing interest and individual

consumer was brought face to face with a shortage of supply. In ordinary times an increase of almost 50,000,000 tons would have found the coal industry demoralized by overproduction while the actual conditions in 1917 found us destitute of fuel in many localities, found our war preparations hampered, found our railroads and manufacturing plants crippled, and threatened the successful outcome of the war for liberty and democracy of the world.

We produced a surplus of coal, but found coal bins empty. Coal was the mainspring of industry in peace times, but is the very heart and sinews of the country's welfare in times of war.

We have had the experience of 1917 to guide us as to our duties and necessities for 1918. We know we must produce 50 million additional tons of bituminous coal in 1918 over and above the production of 1917, if we are to meet the demands and necessities of the war.

There are two ways by which the threatened shortage in coal supply can be overcome; First, by increased production; second, by conservation. Every effort is being put forth by the coal operators and miners' organization, the individual miners and the railroads to produce the maximum tonnage.

The records of production as reported from Washington from week to week since January first are not entirely satisfactory. One week we show a little gain and another week we show a dropping back. This record, so far this year, compared with the previous year, on the whole shows a slight gain, but not enough to spell security.

We can make a splendid inroad into the shortage ahead of us if we will pay special attention to the conservation of coal, and conservation must be practiced to a greater degree this year than ever before if we are to meet war necessities. If the coal operator will see to it that the miner gives him clean coal, and if the miner will follow out his patriotic duty and clean the coal, as he should, at the face, we will relieve the railroads of the necessity of hauling the impurities, we will add greater

efficiency to the performance of locomotive power and aid in the movement of trains. Clean coal will add to the efficiency of every manufacturing plant and every warship and transport, giving more speed to industry, and will go a long way toward helping win the war

by adding efficiency as well as supply. By eternally trying to produce, and infernally trying to conserve, with every effort we have within us bent toward the end of our patriotic duty, with the great consuming public alive to the real situation, with every citizen

a helper, not a knocker, we can and will meet this great necessity of coal supply in a manner that will leave enough coal over and above our own requirements to kindle the fire to finish the job when our boys and the Allies send Kaiser Bill where he belongs!

## Individual Effort Toward Fuel Saving

BY EUGENE MCAULIFFE

Manager, Fuel Conservation Section, Division of Transportation, United States Railroad Administration

THE subject assigned to me, "Individual Effort Toward Fuel Saving," is sufficiently broad to embrace every feature of fuel production, preparation, transportation and consumption. Obvious limitations, however, will restrict me to what would seem, after all, to be the most important angle to which consideration should be given—that of individual effort, greater effort, a more unified effort than we have in the past attempted.

Statesmen and orators have told us we are a great nation. We have come to believe this oft-repeated assertion. It flatters us and it pleases us to be told these things. I confess that I have had in the past three years some fear that as a people we were not measuring up with the illimitable resources and magnitude of our great country, a country of great agricultural wealth, populous cities, great railway systems, all in turn drawing from Mother Earth, from her mines and wells, not only metallic wealth, but the coal and oil on which we depend for heat, light and power, on which our whole industrial and transportation system rests.

No country, no people, can be truly great as the result of individual achievement. We must keep step with and attune our ears to the music of the march of the human race, for while monarchies and republics have risen and fallen the human race has pressed on to better things. The struggle upward has been at times a difficult one; human suffering, blood, misery and brutality have marked the way.

### AT THE THRESHOLD OF GREATNESS

This war will fix our place unalterably; not as one of the nations, but the greatest of all nations in the world, provided each of us does his part. We are at the very threshold of greatness, the door is wide open, and we are about to step inside. When we enter we will be a fully integrated people, with no doubt or question of allegiance; there will be no hyphenated Americans, no Northerners, no Southerners, no Easterners, no Westerners. Despite all our misgivings we will arrive on time; we are now entering the terminal; the signs are too patent to admit of doubt; the way the country has swung in a few months from a nation committed to peace and proportionately defenseless, into one with a great compelling purpose, a great duty, a great army and navy, has been marvelous.

No one with power of perception can

look into the clean-cut faces and at the upstanding bodies of the thousands of young men wearing the blue and brown, who crowd the trains, "going down to the sea in ships," and fail to see in them the crystallization of two years of patience under insult and provocation; aye, challenge. Who of us now fails to recognize the German submarine that called at one of our eastern ports one Sunday morning two years ago, destroying five unarmed ships a few hours afterward, or the flamboyant "Deutschland," as less than a taunt and a challenge?

We are making tremendous strides toward greater individual effort. We have passed the first milepost; but what we who remain at home, we, the real reserve force of the American army must do, is to complete the work of reconstruction of our daily lives so as to make ourselves a living, breathing, fighting part of the country's military force, standing unalterably behind the men at the front, who—our sons and brothers—are the real "shock troops," the first line, depending on you and me to support, whether the fortune of battle sees their line move forward or, with military elasticity, settle back.

Some time ago a friend said to a young soldier who was leaving for France, "It is a great thing to be able to go abroad to fight for your country." "Yes," replied the soldier, "it is also a great thing for you who must stay at home to make and keep it a country worth fighting for."

We must work and we must save. The purchase of a few Thrift Stamps and the denial to ourselves of white bread is not enough. We must look on the winning of this war as a sacrament that it is our great privilege to partake of, and the acceptance of that sacrament means the consecration of all the mentality we can command; all the labor of our hands that we can muster; and most of all, the one compelling idea that all we do, all we can do, is not after all a duty, but instead, an inestimable privilege.

When I speak of working and saving, I wish to speak to you as Americans ail. I do not mean that one class shall work and another class save, but that in this struggle each man and woman should practice more self-denial and perform more service. We must increase the output of the shop, the mill, the mine and the railroad. We must work more hours, show a more intensive application, restrict the number of holidays, and most of all, find our place and

stay there until war expediency or necessity calls for a transfer. The tremendous expansion that the war has brought about has made us feverish. The job offered just beyond appeals to us, and we move; we move again and again, only, as is frequently the case, to come back at last to our original position. The loss of effort that distinctly belongs to our country is most serious, with nothing of gain to show in its place.

### WAR A CONTEST OF SKILL

War is a contest, not alone of fighting skill, but of mining skill in tons of output; of railroad skill as measured by raw and finished materials moved, of passengers, including soldiers and sailors, moved. We are, as I said before, soldiers all, perhaps ununiformed, but standing behind our boys who are the first line troops, standing behind that first line in solid formation with every faculty alert and active, every muscle strained, ready and anxious to give support when the assault comes, and not a shifting, careless, carefree, dollar-seeking crowd, careless of the measure of duty we perform, indifferent to the quality of the material we produce, indifferent as to whether it arrives on time or otherwise.

There can be no middle course; we must take on more responsibility, more work. One-third of the man-power of the country, or more than ten million men, are now directly, or indirectly, engaged in the war; and the end is yet far off. The casualty list, as yet a tiny, trickling stream, will soon grow into a brook; it will pause as it runs past the door of many, many an American home—at the home of the worker in the mine, the factory and the ship yard; the home of the conductor and the brakeman; the engineer and the fireman; the dispatcher, the roundhouse man and the superintendent; at the home of the farmer and the plainsman; at the doctor's door; the lawyer's door; the capitalist's door; wherever the blue star of service hangs in the window. And they are becoming numerous now, the million mark has been passed already—that stream will leave a stain of blood, of tears, of sorrow.

If we are to prevent this brook from growing into a river, a river of American and Allied blood—the best and most chivalrous blood the world ever saw, blood which courses through arteries and veins under the inspiration of ideals such as the world never before advanced, ideals that carry no taint of



lust for land or wealth—we must as miners and railroad men mine coal, mine clean coal, move coal and save coal; we must crush our individual prejudices, our likes and dislikes; we must “carry on”!

A few days ago I reread the story of the “Oregon,” and that memorable journey of 20 years ago from San Francisco to Santiago, Cuba. There was not a single American, man or woman, then living, who did not follow Captain Clark and his magnificent crew of men through every one of the 16,000 miles that the “Oregon” drove on her way to join the South Atlantic fleet for the defense of our country in the war then impending. I want to retell in a few words the story of the “Oregon.” To my mind that story is our American Odyssey. Her story will appeal to motive-power men, to machinists, to engineers and firemen, and I think to miners.

#### “OREGON” BUILT ON HONOR

The “Oregon” was a creation of the West. She was built in San Francisco by the Union Iron Works, and Captain Clark said, “She was built on honor.” When her builders, after installing first-class tubes in her condensers, found a superior metal, they took out the first set of tubes and replaced them with the better article at their own expense. Her builders started right. Is it any wonder that she was built and manned right?

On Mar. 19, 1898, the “Oregon” steamed out of the Golden Gate, down the west coast, from temperate California to the scorching equator. You can imagine the heat and discomfort of a ship’s stokehold in the torrid zone, fresh water and ice alone making living possible. At this juncture the chief engineer reported that the use of salt water in the boilers meant scale; scale meant coal; and most of all it meant loss of speed, loss of ability to maneuver quickly when the supreme test came. The crew as one man told the officers to reduce the supply of fresh water issued to them, and the use of ice was entirely restricted to the firemen and coal passers.

On swept the “Oregon,” her engines throbbing, her furnaces glowing down through the tropics, into the icy, storm-swept Straits of Magellan, where runs, it is said, the swiftest and most treacherous currents in the world. Captain Clark admits bad moments as he approached the “end of the world.” But the “Oregon” steamed on, her boilers were kept clean and tight by the sacrifice of her crew, the steam pressure never failed. The condensers built on honor maintained the required vacuum, her heavy bearings ran cool.

The Straits were passed, and the run up the east coast toward the tropics was well on. Then the officers, concluding that the Cardiff coal taken on at Frisco should be conserved for the coming hour of battle—for the news that war had been declared reached the ship at Rio—sailors and coal passers began the exhausting work of rehandling the

cleaner, higher grade coal, placing it in bunkers where it would be ready for the supreme hour.

This, to my mind, is the true definition of quality. Johnson’s, Worcester’s, Webster’s, all the world’s dictionaries in fact, never defined the word quality as did the crew of the “Oregon.” They knew coal, clean coal, coal of quality; and they knew that without clean coal the “Oregon’s” guns would not save her from defeat.

Can we not visualize the value of clean coal, mined and loaded on honor? Its value to the men who stoke and sail our transports, laden with the living, breathing embodiment of the million blue stars that show in our windows at home, stars whose azure blue will soon, alas too often, turn the color of hammered, fire-purified gold? Its value to the men who man and fight our battle-ships and our destroyers, who convoy the star-laden transports? Its value to the young men just enlisting in the great transportation army, the locomotive firemen, young men fresh from schools, farms and shops, to whom the work is now strange and arduous? What does not clean coal mean to all of these? When we pause to reflect how far-reaching is our thoughtlessness we often shrink from the study.

#### CRUISE AT AN END

Sixty-five days after leaving Frisco, on May 24, 1898, Jupiter Light on the Florida coast streamed out on the “Oregon,” and the memorable journey, which crystallized in the birth of two new republics and the rending in twain of the western continent, the dream for centuries of kings, statesmen and engineers, was at an end.

There Captain Clark received a terse short order from the Navy Department, the substance of which read, “If in need of repairs go to Hampton Roads; if not, go to Key West, coal and join the Atlantic Fleet.” The “Oregon,” built by Americans, of American-made steel, whose sheets, seams, tubes and stays were driven together by Americans, whose shafts and bearings were forged, wrought and scraped to a fit by American mechanics, whose bunkers contained a remnant of clean Cardiff coal reinforced by clean, mined-on-honor coal, from American mines, answered, “Ready,” and turned her prow toward the shores of struggling, monarchical-cursed Cuba, where that festering old-world product, Weyler, then reigned supreme. She took on board, on May 27, sixty men from the Chicago Naval Reserve, young men whose whole training was received within sight of the City of Chicago. On Sunday morning, July 3, the Spanish fleet came out of Santiago Harbor in battle formation, while the “Oregon,” stripped of every superfluous impediment, deckboats, ropes, stanchions, every possible obstruction out of the way, her decks sanded, the gun crews standing by the guns, naked to the waist line, sprang, under the impulse of her engines to the head of the line. And, at 9:27 a.m., her guns fired the first shot in an action that

quickly ended a drama which closed with the furling of the Spanish flag and the end of old-world domination in the western hemisphere.

Can we not as miners and railroad men strip ourselves of all passion for profit, all controversy and prejudice, all obstruction, of whatever character, and go out with the determination to forget self, with the firm determination to follow our ideals, the successful conclusion of which will offer wordly opportunity without end?

Perhaps in passing I might well speak of what, to me, seems a great and already flowering field of opportunity, one that reaches out to the miner working in the bowels of the earth, out to the railroad man in the cab and the caboose.

Twelve hundred years before the coming of Christ, Tyre, on the Syrian coast of the Mediterranean Sea, was the greatest seaport of the world. Her merchants were known as “men of Tyre,” her vessels were known as “ships of Tyre.” Her commerce made and unmade men, cities and principalities. With prosperity came love of luxury, selfishness and other evils, and the command of the seas passed to others.

Seven times since then the over-seas commerce of the world has changed hands; early in the nineteenth century Yankee shipbuilders constructed clipper ships, with keel, ribs and sheathing cut from Maine forests, and with masts that were so tall as to seem at night to carry their tops through the stars, claiming the commerce of the world.

Then came Sir Henry Bessemer, and cheap steel—and Great Britain won back her place as mistress of the seas. And the sun set on the clipper-rigged ship of 50 tons burden, manned by men who were hardy and courageous enough to drive their ships through a gale, every inch of canvas set, at 18 knots an hour. Perhaps we yielded to staid Britain more easily than we would have done if the West—California, Oregon, Washington, the work of spanning the continent with iron rails, the eternal lure of the West—had not beckoned. That work is now done. There is now no frontier, and we are turning back to the sea for new adventure.

#### SHIPYARDS BUSILY AT WORK

In one shipyard alone men are working on 50 keels at one time. From British Columbia, down the west coast to the end, and from Texas to Maine the shipbuilder is carving out the greatest merchant marine the world has ever seen—single ships into whose holds will be poured the contents of hundreds of freight cars for transport to the ends of the seven seas. Our army officers are building the greatest port facilities, warehouses and terminals ever conceived. All of which makes a new era.

What a vision of opportunity this offers to all Americans; not alone to the men of New England, but to the men of Kansas, Nebraska and the other inland states; to even the men of sun-baked Arizona. This means transportation to the men of the rails; coal to the men of the mine; glory and greatness for us, Americans all!

## Individual Effort and the War

By E. N. PRATT

President International Railway Fuel Association

**T**HIS war is indeed a serious matter, the winning of it a stern and determined necessity to us all. As individuals we take a back seat for no one when it comes to patriotism, but it has been my experience and observation we know not always wherein our individual duty lies nor do we sense its importance in the big game. We are wont to say: "What's the use of the extra exertion to save a shovelful of coal when another can save a ton?" "What's the use of unloading a car of coal a day earlier when we see trains of coal remaining unmoved daily?" "What's the use of firing a locomotive with care when the train dispatcher holds us an hour on a siding?" "Why repair a car today by extra effort when there will be 'just as many' tomorrow?"

It reverts to the old Bible story where the master called his servants together and gave talents or responsibilities to each according to his ability. "And to one he gave five talents, to another two, and to another one."

Some of us can do more than others; such have the responsibility equal to five talents. Others are in a position to do less, but all of us have it in our power to a greater or less degree to help win the war by doing our best. There is an old Scotch saying that "many a mickle makes a muckle." It is not expected that the miner can do as much as the operator, but both can do wonders in the improvement of the quality of fuel coal if their heart be in their work. The stationary fireman can do less toward fuel economy than the manager of the plant, who can provide efficient devices. Neither can the locomotive fireman save as much coal on his one engine as the train dispatcher with dozens of trains on a single track road, but each can and must do his part.

There are three items in this tremendous fuel problem—production, transportation and consumption—and the railroads are largely responsible for all three; for production in so far as concerns the delivery of machinery and supplies to the mines and a car supply for the coal produced. But the miners and operators both can do much in this particular.

How often have the mines dropped empty cars by the shaft for some trivial reason? This might be refuse in the cars, a hole in the floor or sides, a brake chain broken. How little effort on their part would avoid this loss of use of one or more cars for a whole day? I venture to say that this trivial item amounts to several thousands of coal cars each day.

The next item is transportation, largely by rail, some by water. Railroad men are a hardy and earnest lot and not easily discouraged, working every day in the year including Sundays and holidays that their task may be accomplished with credit to themselves, their employers and to their country. But when, last winter, after weeks of continued and unprecedented snow and cold their locomotives were compelled to operate with added disadvantages of poor and dirty coal, it was perhaps the greatest obstacle of all and many a locomotive died and its train was abandoned for this reason.

I have yet to see a miner or operator who would defer to the railroad man in the matter of patriotism or loyalty to country, and I believe if the proposition is put squarely up to the heart of the man that there will be no Sundays or holidays in either the mine, or the railroad, or in the coal yard, any more than there is Sunday or holiday in the trenches with the

Hun facing our boys and the Kaiser menacing our free institutions.

Notwithstanding the fact that the railroads are great users of coal, the public should bear in mind that others are also responsible for waste. Therefore, when we seek the greatest economy in the use of fuel there is a tremendous need of an educational campaign at the kitchen stove, the house heating furnace, the power plant, the coke oven and the kilns that bake clay.

Yet this 27 per cent. of the coal which is used by the railroads is so large that we hope by care and close attention to details, not only as to firing, but better repair of locomotives, more care in dispatching and moving trains and better operation on the part of the engineer, to save millions of tons of coal and millions of gallons of fuel oil. The War Department's arrangements for deferred classification for skilled railroad men, places them under a peculiar obligation for extra effort in their work.

Superheating has been proved practicable and each locomotive so equipped saves hundreds of tons of fuel per year besides rendering faster and better service; hence the present practice of placing superheaters upon the larger locomotives passing through the shop should be continued as far as possible, considering the scarcity of materials and skilled labor to apply them. The locomotive feed-water heater also offers an attractive field for economy and efficiency and well warrants careful and continued experimentation.

It has been said, "Ships will win the war," "Food will win the war," "Coal will win the war"; but I tell you it is individual effort that will solve the fuel problem and thus render its great share in winning this war for democracy.

The leading feature of the morning session on May 24 was the thunderous applause which greeted the announcement of John P. White, former president of the United Mine Workers of America, and now labor advisor for the United States Fuel Administration, that peace in the American coal fields was assured for the duration of the war. The 1200 railroad men and coal operators who packed the hall gave White an ovation when he declared the 700,000 American coal miners are eager to work every day, Sundays and holidays, getting out the extra 200,000,000 tons of coal that will be needed this year if we are to keep business going in such a way as to win the war. He said the 87,000 miners of Illinois alone, who worked only 160 days and mined 60,000,000 tons, could get out 150,000,000 tons this year if enabled to work full time.

"Let the railroads quit haggling over the price and start buying their coal," said Mr. White. "Everybody else will follow suit, production will rise, and we won't have any coal famine next winter. The one mistake

that has been made," he added, "was in talking price instead of production."

Claxton E. Allen, deputy fuel administrator for Illinois, said records of all coal dealers are being kept, so that if necessary the administrator can take coal from those who have a surplus and allot it to others who have none, if that measure prove necessary to prevent suffering next winter.

"Fuel Oil and the War" was discussed in a paper sent by M. L. Requa, director of the oil division of the Fuel Administration. The diversion of oil tankers from coast lines to transatlantic army supply service make it necessary for the railways to haul an extra 100,000 barrels of oil daily from Southwestern fields to the North Atlantic war-industry centers. Pipe-line deliveries are to be increased by 20,000 barrels daily. Fuel-oil users were urged to increase their storage capacity.

H. A. Garfield, the United States Fuel Administrator, sent a telegraphic greeting to the convention, emphasizing the national need for all fuel users to avoid waste.



# National Coal Association Meets

*National Coal Association began its first annual meeting in Philadelphia on May 28. The chief address of the day was made by J. D. A. Morrow, Director General of Distribution for the United States Fuel Administration. An abstract of his address is given below.*

EVERY country that has gone into this war has promptly found itself faced with a difficult coal problem. In Great Britain, within six months after war had been declared, 250,000 coal miners had enlisted, and the production in Great Britain fell off 25 million tons. The railways were congested with traffic, and the country faced an industrial crisis.

England met that problem by taking over her coal industry absolutely, by fixing prices, by zoning the movement of coal on her railway lines, by putting into effect regulations concerning distribution and supply of coal more rigid than anything we have had in this country. In Germany, the production of coal fell off 35 million tons in the last six months of 1914, which was a reduction of nearly 20 per cent. In the next year, the production declined another 12 million tons.

We have no authoritative figures of the German industry since the year 1915, but we do know that they have been so short of coal in Germany that the suffering there among the ordinary people during the winter was more severe than anything we had in this country, and strict and rigid measures have necessarily been imposed by the German Government, in order to support the war machine.

The important French coal fields were overrun by the enemy at the outset of the war, and production was cut squarely in two. The supply there has been cruelly short, and every pound has been distributed by the Government. That has been the case also in Italy.

## COAL CRISIS NOTHING UNUSUAL

Thus it is nothing unusual for us to have a coal crisis in this country. You are all familiar with the insatiable demand for coal that coincided with congested traffic on our lines, and within six months after the declaration of war the United States had set up a Federal Fuel Administration, the industry was under Governmental control, and we had followed to that extent at least in the footsteps of other important belligerents.

So it is that this industry now faces a set of conditions it never faced before at the beginning of a coal year, and I think it is entirely true when I say that upon the wisdom of the manner in which the coal people of the United States meet these new conditions and upon the energy of their efforts will depend largely the success of the Allies in this war; because you all must know that a great deal of the industrial activity that is to support the armies of Great Britain, France, the United States and Italy will rest upon the manufacturing industries of the United States, and this goes back squarely to the coal mines.

Now, when I took up the work of directing the distribution of coal, it appeared to me that one of the

first things we needed to know was what the requirements for coal would be. Nobody knew how great the real need for coal was. We want to know where we stood with reference to the coal demand for the coming year. To get that information we obtained reports from more than 100,000 industrial concerns, stating the exact quantity they consumed yearly. We obtained reports from 40,000 retail dealers covering their annual deliveries. We obtained reports from the Shipping Board, the War and Navy Departments, and from other Government sources, regarding the building of new factories and extensions to old ones, and the increase of activity in other plants. That information was checked up by the fuel administrators in the more important states. We also called upon private sources of information. When we had those figures together, we found that to run the United States on a war basis this year we need 735,000,000 net tons of coal.

## ANTHRACITE PRODUCTION WILL BE SHORT

It seems likely that the production of anthracite cannot exceed the output of the past year, namely 89,000,000 gross tons. The difference must be made up out of the bituminous mines. The bituminous mines of the United States this year are called on to produce 85,000,000 more tons than they produced last year, which was a record year.

To give you some measure of the responsibility that rests today on the coal producers of the United States let me say that they are called upon to produce more coal this year than all the mines of all the rest of the world combined.

As an example of needs, one single war plant today is calling on us for 5000 tons per day. On the first of July that tonnage will jump to 7000 tons a day, and that means 2,500,000 tons of coal a year.

Another plant equally important on Aug. 1 will double that demand exactly. Another group of war plants will ask us before the year is over for 1,500,000 tons of coal per month. Four new Government war plants this year will consume more coal than all the manufacturing plants, ships, power plants, gas works and street railways consumed last year of bituminous coal in the entire state of New Jersey. The demands for bunker coal for ships in the North Atlantic this year will be materially increased over last.

These are some of the factors that go to make up this demand for coal that enter into the total of 735,000,000 tons. When we face the question of whether that coal can be produced the question is immediately asked, Can the railroads furnish transportation enough to haul it? That is a question that the Railroad Administration will have to answer. The Fuel Administration and the Railroad Administration are working together in the closest harmony.

Mr. McAdoo and Mr. Gray are fully alive to the supreme importance of furnishing transportation enough to give this matter of coal its proper attention, and you may rest assured that they will bend every effort to accomplish that result.

We are now getting distinctly increased efficiency in the transportation of coal because we are working hand

in hand with the Railroad Administration. When I say that I doubt if the railroads can haul that tonnage of coal, whether they can transport it properly with respect to the Eastern part of the country, it does not imply any criticism of the Railroad Administration; it is simply a recognition of the fact that the roads are overburdened with war traffic and that if they furnish the transportation to turn out this tonnage they would do so at the expense of steel, iron ore, cotton and wool and food supplies, and other equally vital commodities, and we would gain nothing. So there has to be a consonance of action in the administration of transportation; and the portion of coal that can be moved and will be moved must be carefully worked out with respect to what necessarily must be furnished other lines of goods.

#### DOMESTIC CONSUMER MUST BE CARED FOR

Under these circumstances, then, we clearly and definitely face the prospect of a slight shortage of coal this year. Under these conditions we are trying to see that the domestic consumer is taken care of; that the supreme important users of coal get their supplies, and that if any is left that can go to the less important consumers there is where it will go. This is precisely the plan on which we are now running. This involves a decision as to who are the supremely important users of coal. That is a question that now is definitely settled by the decisions of the War Industries Board. That board is authorized by the President to decide on preferences and priorities in the deliveries of raw material; in other words, to decide who is entitled to supplies of such raw materials.

Bernard M. Baruch is chairman of that committee, and he has full authority of the board to see that the railroads and the ships and the food plants and other important war industries receive their supplies. Plants will be asked to state from day to day the amount of their consumption and the tonnage that is on the way to them, and then they will be granted such amounts of coal as the judgment of the board dictates.

In order to make sure that an equitable distribution is had between these important branches we have to get some very definite information about where the coal is going. We are now in the process of simplifying and reducing all kinds of information and getting it down to the lowest possible terms.

We intend to require every industrial consumer of coal in the United States to register and to report weekly his exact amount on hand, his consumption, his receipts and the amount that is moving to him. If we have all this information it will enable us to act intelligently; for we will know, at any time, how any given plant or industry or section of the country stands with respect to its coal supply, and it will then be possible to prevent trouble before it occurs in many instances, rather than to try to cure it afterward.

The Fuel Administration also thinks it is necessary to get consumers of coal to cut out a part of the waste in the use of coal. As coal is now burned, not merely by domestic consumers, but in many steam plants, there is an important element of waste. The Fuel Administration is organizing a conservation division which is to inspect the plants and teach the users of coal better

methods of burning it in order that tonnage may be saved. It is estimated that if this can be done on a large scale this year it will be possible to save perhaps 20,000,000 tons of coal. Unless this is done many plants necessarily will be without coal and to some extent will have to curtail operations.

I want to make it clear that the Distribution Division of the Fuel Administration intends to be sufficiently in control of the situation to make sure that the domestic consumer gets his supply, that the railroads have theirs, and that the important war plants are all running, and that our ships get back and forth across the Atlantic. If we do that, if we take care of the domestic consumer and keep these plants running, it will be possible for us to avoid the suffering that occurred last winter and the working machinery of the United States will not lose one single stroke for lack of coal.

Since we are called on this year to produce and distribute more bituminous coal than all the other bituminous producers in the world combined, it goes without saying that we need a man with outstanding capabilities to handle that feature. We found that man in A. W. Calloway, president of the Davis Coal and Coke Co.; and since the day he came to the Fuel Administration there has been great advancement made in the development of means of coal distribution.

Some of the other men that we have in the Division of Distribution are Assistant Director S. L. Yerkes, of Birmingham, who is one of the most capable men in handling details I have ever met. The management of the distribution of coal in the Northwest and for Canada is in the hands of C. P. White. He has spent years in the Northwest. The distribution of railroad fuel will be in the hands of Walter A. Marsh. The tidewater distribution is in the hands of Mr. Cochran, formerly coal traffic manager of the Baltimore & Ohio, who is assisted by two other gentlemen.

#### WHERE THE CONSUMER COMES IN

It may be asked, Where does the consumer come in? He comes in in two ways: In the first place these coal men have nothing at all to do with the price of coal. We want nothing to do with it. If we get coal to the places where it ought to go, we will have all we can say grace over. The consumer is also represented in the Distribution Division through the state fuel administrators and their county chairmen, who are intimately in touch with the respective localities. The War Industries Board has asked that in the application of its rulings the state and county chairmen shall decide, in their localities, what consumers and plants come within the designated classes. These men are on the ground and they can find out the facts more quickly than there is any possibility of our finding them out in Washington.

The work of the state fuel administrators and county chairmen heads up in Washington in the Director of State Distribution, A. M. Ogle, who has just been appointed. This means that there will be someone at Washington whose business it will be to see definitely that the work of the state fuel administrators is properly meshed with the other work; in other words, that, to use an expression in Washington, we make sure we



all coordinate. This official will also see that general plans for the distribution of coal are carried out uniformly in the different states by the various state fuel administrators.

What I consider the important part of the Distribution Division in the Fuel Administration is made up of the coal operators and coal salesmen of the United States. It is our theory that those men comprise a highly efficient body of coal distributors, each one of whom knows intimately the business needs of his own customers and his own sections of the country. Those men will largely effect a fine distribution of coal. What we need to do is to organize and unify their efforts and direct them along lines that may be necessary, in order to get the supply of coal where it is needed at the time it is needed; in other words, to make sure that the preference consumer is really preferred. We expect a large part of the output of coal to move along the lines it would ordinarily move, through accustomed relationships and channels of business. It is only necessary to interfere with that movement in order to make sure that some important war plant is not only getting its current supply of coal, but building up a stock for next winter, and to make sure that the retail dealers are getting their coal in plenty of time; to make sure, in short, that coal is not diverted into unimportant and wasteful channels. To the extent that that may be necessary we may have to interfere with business, to take care of some particular consumer or plant, but I think that that interference will be reduced to a minimum. This is one of the misfortunes of war. It is not a desire on the part of the Fuel Administration; it is a thing we view with regret, but with a feeling that it is necessary.

#### ZONING PLAN BENEFITS RAILROADS

The zone system of distribution was put into effect before we started, and we have simply gone ahead and carried out the plans submitted to Mr. Garfield. It has proved beneficial to the railroads. The vice president of the Norfolk & Western R.R. gives some idea of how it is helping that road. He says: "A comparison of the movement of loaded coal cars in our coal districts during the seven-day period May 4 to 10, 1918, to determine the advantages derived from the zone regulations, indicates that there was a saving in loaded car mileage in coal fields of 15.2 per cent. or 6982 loaded car-miles in seven days. This is simply the saving of car miles in the coal regions on our lines and does not take into account the saving that has been effected between the origin zones and the points of destination by the elimination of cross hauls."

This is indicative of the important saving in transportation that was effected by the zoning of coal. That zoning no doubt interfered with customary trade relations, it interfered with the customer in getting his supplies. We have this evidence of the fact that the sacrifices made have greatly helped our transportation problem at a time like this, when that is all-important.

To date we have been most admirably supported by the coal men themselves. There have been times when we have made mistakes, made lots of them; we will probably make a good many more. Nobody knows everything about the coal business nor even a small part about all of it, but we are trying to get together in

Washington a personnel of leaders in this business in positions of responsibility, men that the coal industry can follow with confidence and respect.

When we do make mistakes I hope that the coal men will do what they thus far have done. They have come and said, "If this is what you want to do, you are making a mistake in the way you are going about it; we feel that you can accomplish better results by doing it in such and such a manner." And in every instance when coal men have come to us in that manner whoever it may be that is particularly affected and concerned with the problem has sat down with those men and said, "Well, let us get together and fix this up right." They have met us halfway, and so far as we are concerned we hope that will continue to be the practice in working out the most effective distribution of coal this year.

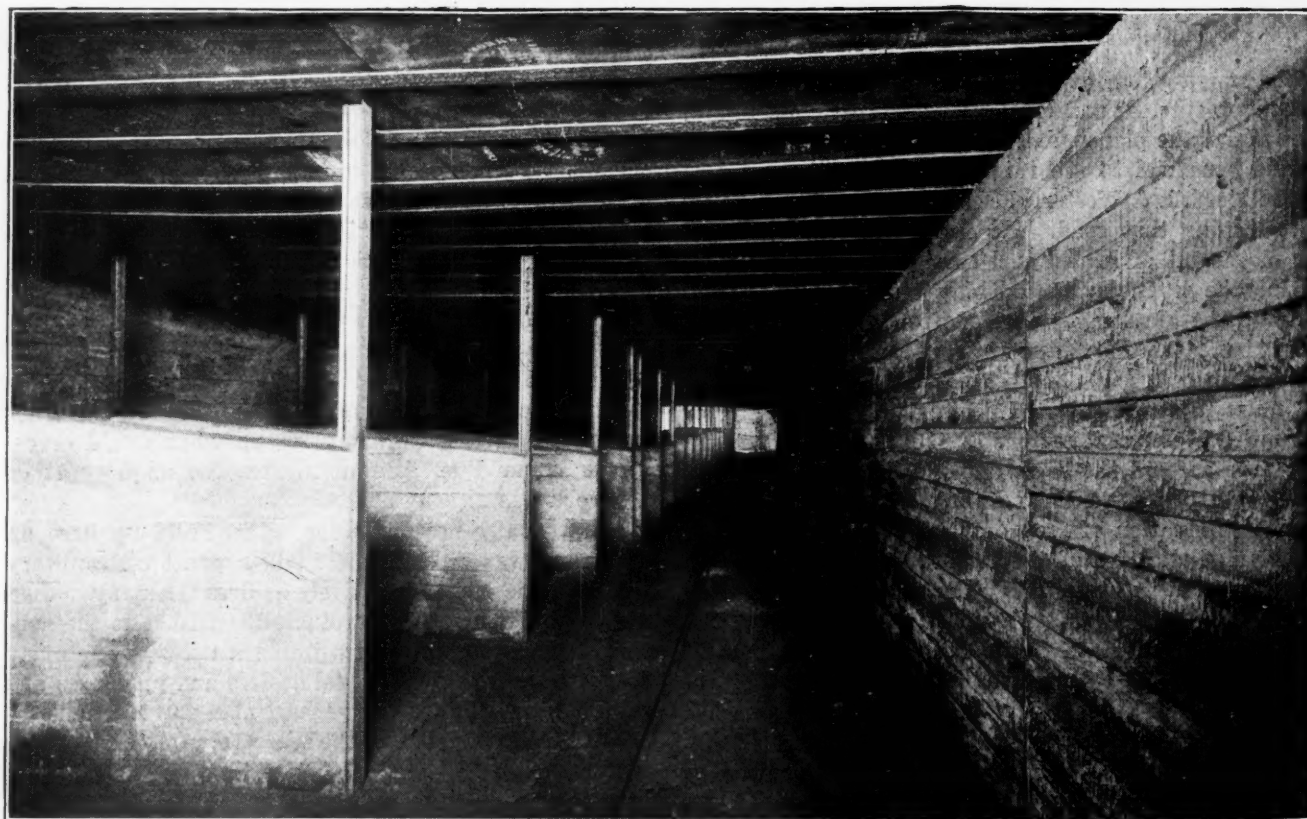
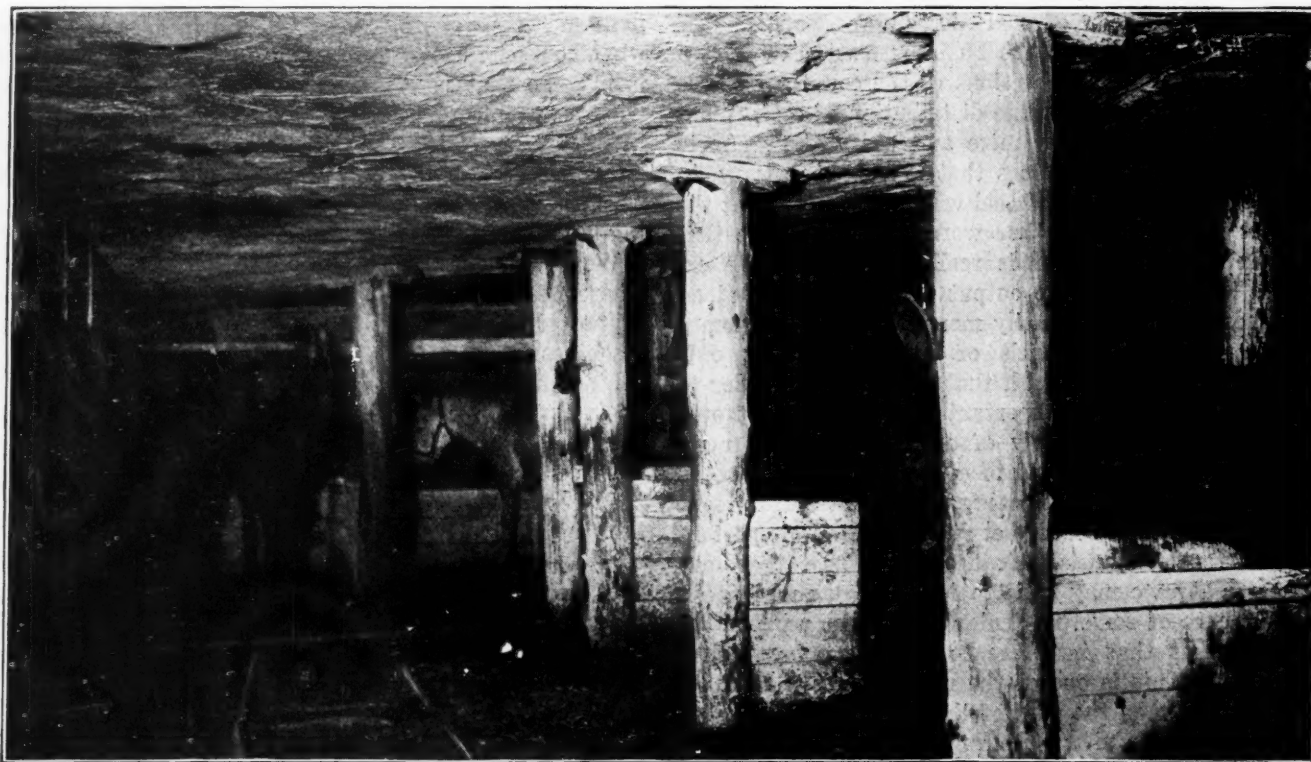
We now understand that for modern war to be anywhere near successful the armies in the field must be supported by equally effective and magnificent war machines built up in the industrial life of the country behind the armies. Germany had exactly that kind of an industrial machine completed before ever this war began. The entire electrical and chemical industries were centered in four groups of producers. The blast furnaces and iron men of Germany were organized in the Rhine basin into one single centralized concern that controlled 97 per cent. of the output of pig iron, gray iron, spiegel and other products of that character, and it was intimately related with the single central agency, the Stahlwerks Verband, which controlled absolutely the production and sale of steel in Germany.

The important part of the coal industry in Germany was in the Rhine Valley. That was the part that supported the steel plants and the great industrial activity of the German Empire. And the coal industry in that section was organized into one single, central concern, which had in its hands the control of the entire distribution of coal throughout Germany. That organization was matched in the Silesian coal fields by a similar organization, not nearly so important or large, because the production was not so large. That organization in the Rhine Valley was intimately related with and connected with the combination of iron and steel producers, and then in turn with the important electrical and chemical concerns. Thus when Germany undertook to swing her industrial machine into line behind her armies she needed only to get in touch with the fuel leaders who were responsible for the action of the other industries. When Germany set up what would correspond to our Fuel Administration, the major part of the work was already done.

It is equally necessary for us to build up here an industrial war machine that will support our military war machine just as effectively as does Germany's. Just as the soldier has to subordinate his wishes to the general plan, so the coal man will find it necessary in many respects to lay aside personal desires and privileges and submit his wishes to the general plan for the industry as a whole in support of the war program.

For the coal man to take that action, to play that part in the prosecution of this war, there will be no sleeves with chevrons, no shoulder straps with stars, no military medals or anything of that kind, but he will have the consciousness that he is definitely doing his part to make the world safe for democracy.

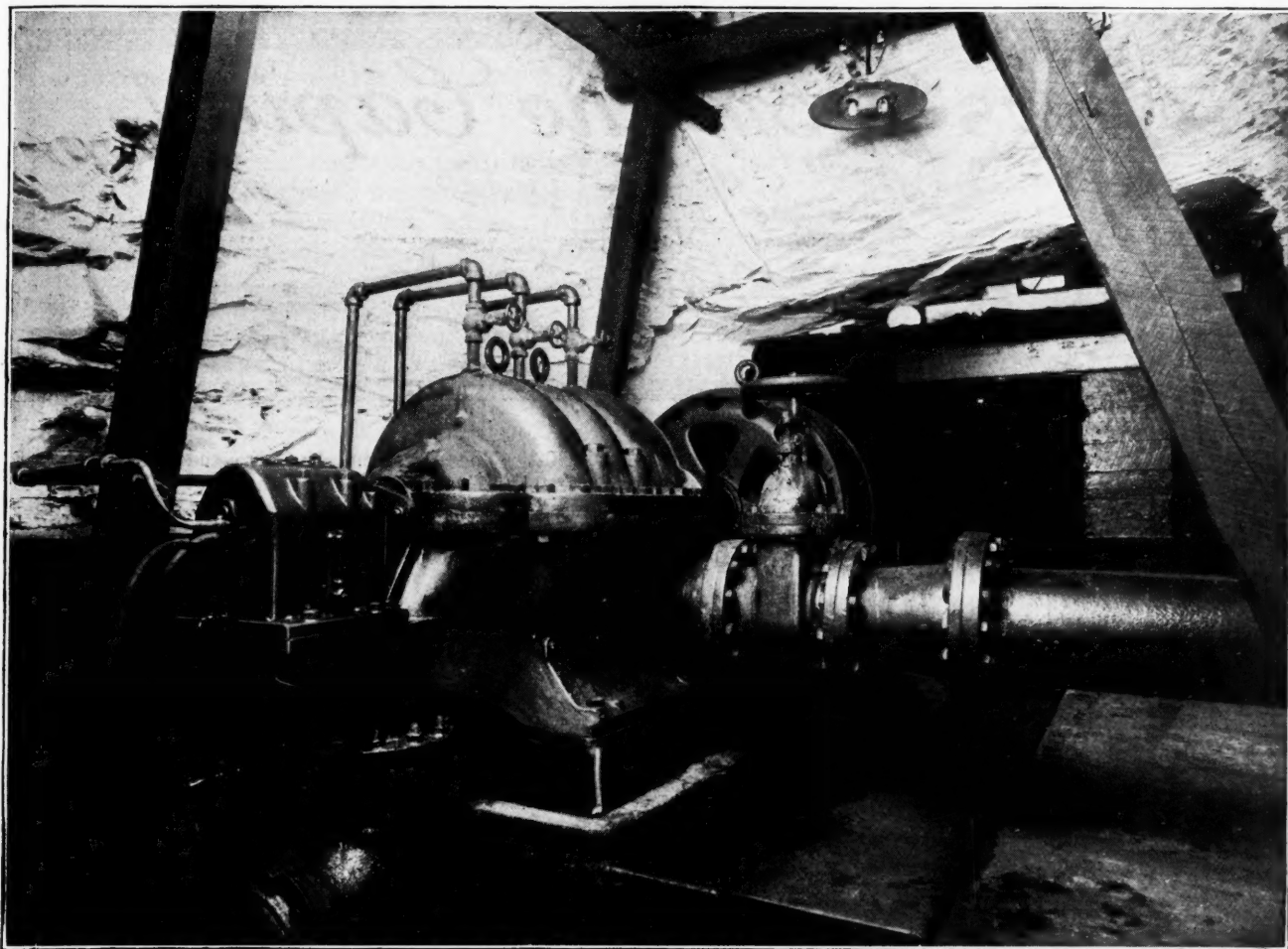
## SNAPSHOTS IN COAL MINING



OLD AND THE NEW IN UNDERGROUND MULE BARN

The top view shows the old mule barn at the Diamond mine of the Delaware, Lackawanna & Western R.R., Coal Department.  
The bottom view shows the modern concrete and steel barn at the Truesdale mine of the same company





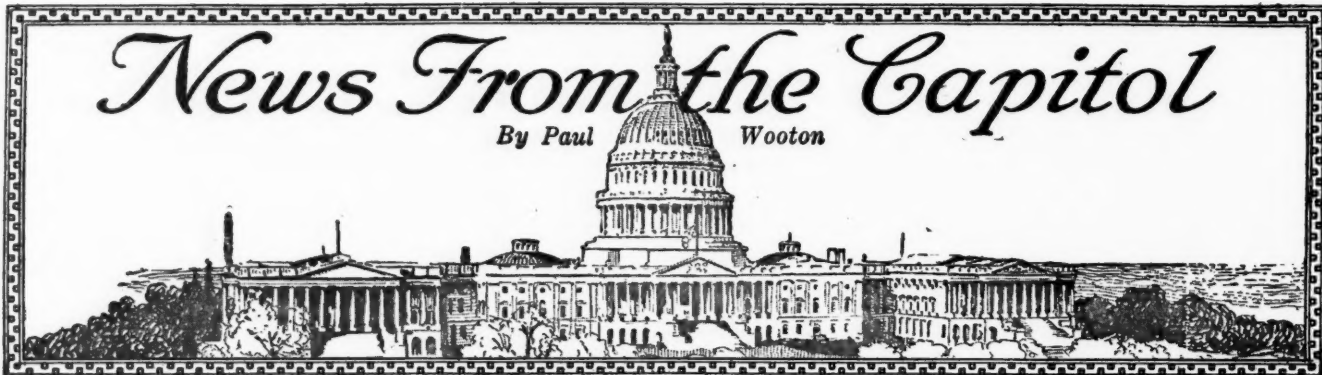
THREE-STAGE CENTRIFUGAL PUMP INSTALLED BY THE CONSOLIDATION COAL CO. IN ONE OF ITS WEST VIRGINIA MINES



CONCRETE ARCHES IN THE WOODWARD MINE OF THE DELAWARE, LACKAWANNA & WESTERN R. R., COAL DEPARTMENT

# News From the Capitol

By Paul Wooton



## Railroad Fuel Controversy Settled

Settlement of the railroad fuel controversy is regarded here as an unqualified victory for the coal operators, championed as they were by Dr. Harry A. Garfield and his organization. The fact that 10c. a ton was stricken from the price has brought in some protests from operators but, as a whole, operators appear to be more than satisfied by the establishment of the principle that railroads are not entitled to cheaper coal than are other consumers. It is regarded as a victory for the consumer as well, who probably never again will be forced to pay the only profit which was earned by the producer of coal.

The reduction of 10c. in the official price was made with the thought that the elimination of assigned cars would result in a saving in operating costs. Issue is taken with this conclusion, however, from the fact that average costs are bound to remain the same. The reduction, however, will not be noticed at mines where the car shortage is not unreasonable. The National Coal Association had expressed the opinion to Dr. Garfield, prior to the agreement, that a reduction of 5c. in the price would be warranted.

The reduction in price will fall heaviest in Alabama, in all states west of the Mississippi, in southwestern Virginia and in certain other restricted fields where production costs already were close to the maximum price allowed. The new price took effect at 7 a. m. May 25. The official order reads as follows:

The United States Fuel Administrator, acting under authority of an executive order of the President dated Aug. 23, 1917, appointing said administrator and of subsequent executive orders and in furtherance of said orders and of the Act of Congress therein referred to and approved Aug. 10, 1917—Hereby orders and directs that all prices for bituminous coal f.o.b. mines in the coal-producing districts throughout the United States fixed by the said executive order of the President, dated Aug. 21, 1917, and subsequent orders of the United States Fuel Administrator and in effect at 7 a. m. on the 25th day of May, 1918, shall be and the same hereby are reduced as to all shipments made after 7 a. m. on the 25th day of May, 1918, by the sum of 10c. for each net ton of 2000 pounds.

This order shall in no way affect the increase contained in the executive order of the President, dated Oct. 27, 1917, adding the sum of 45c. to the prices fixed for bituminous coal under the terms and provisions set forth in said last-mentioned order.

The order was accompanied by the following official statement:

The reduction will mean an annual saving to consumers of a sum estimated by the Fuel Administration at

\$60,000,000. The President has directed that the railroads pay the Government price for coal. The increased cost of railroad fuel thereby occasioned is also estimated at \$60,000,000 per annum. The reduction of 10c. per ton on all coal will, however, reduce the net increased cost to the railroads from \$60,000,000 per annum to \$45,000,000 per annum. Under the President's plan, the railroads will furnish cars to all coal mines alike, without discrimination except as dictated by the prior requirements of the railroads for operating purposes and the needs of domestic consumers and of the war.

Under the present war demands, the maximum output of every mine working at full time would still be insufficient to meet the country's coal needs. The principle of equal car supply has accordingly been adopted so as to make for as steady an operation as possible of all properties, and for continuous employment of men, thus making for maximum output.

The introduction of the principle of even car supply will reduce the general average overhead of mine operation, and thereby justifies the Administration in putting out a price reduction order. It is understood that the mine prices thus fixed will remain undisturbed until the United States Fuel Administrator has before him the cost returns for the twelve months ending Aug. 31, 1918. The returns thus far in are being carefully studied by Fuel Administration accountants and engineers with a view to making the utmost saving to the public that is consistent with a maximum production of coal.

The order issued will have no effect on the price of anthracite coal, which forms the bulk of the domestic consumption fuel in the eastern part of the country.

Consumers of bituminous coal who have already entered their orders for the year's coal supply, but whose coal has not yet been delivered, will, of course, receive their supplies at the reduced price effective tomorrow. This price applies to all coal which leaves the mines after 7 a. m., May 25, no matter how long the order for the delivery of the coal has been standing.

Coal delivered after 7 a. m., May 25, under contracts which have been entered into since Dec. 29, 1917, will be billed at the new price. Under the regulation of the Fuel Administration all such contracts call for the delivery of coal at the Government price effective at the time of delivery.

## Increased Freight Rates on Coal and Coke

The full text of section No. 2 of General Order No. 28 of the United States Railroad Administration, which provides for the increase in freight rates having to do with coal, coke and ores, is as follows:

### SECTION 2—COMMODITY RATES, DOMESTIC

A. Interstate commodity rates on the following articles in carloads shall be increased by the amounts set opposite each.

Commodities—Coal: Where rate is nothing to 49c. per ton, 15c. per net ton of 2000 lb.; where rate is 50 to 99c.



per ton, 20c. per net ton of 2000 lb.; where rate is \$1 to \$1.99 per ton, 30c. per net ton of 2000 lb.; where rate is \$2 to \$2.99 per ton, 40c. per net ton of 2000 lb.; where rate is \$3 or higher per ton, 50c. per net ton of 2000 pounds.

Where rates have not been increased since June 1, 1917, the increase to be made now shall be determined by first adding to the present rate fifteen (15) cents per ton, net or gross, as rated, or if an increase of less than fifteen (15) cents per ton, net or gross, as rated, has been made since that date, then by first adding to the present rates the difference between the amount of that increase and fifteen (15) cents per ton, net or gross, as rated, and to the amounts so constructed the above increases shall now be added.

These rates from producing points or to destinations have been based on fixed differentials in cents per ton, such differentials to be maintained, the increase to be figured on the highest rated point or group.

**Coke:** Where rate is nothing to 49c. per ton, 15c. per net ton of 2000 lb.; where rate is 50 to 99c. per ton, 25c. per net ton of 2000 lb.; where rate is \$1 to \$1.99 per ton, 40c. per net ton of 2000 lb.; where rate is \$2 to \$2.99 per ton, 60c. per net ton of 2000 lb.; where rate is \$3 or higher per ton, 75c. per net ton of 2000 pounds.

Where rates have not been increased since June 1, 1917, the increase to be made now shall be determined by first adding to the present rate fifteen (15) cents per ton, net or gross as rated, or if an increase of less than fifteen (15) cents per ton, net or gross as rated, has been made since that date, then by first adding to the present rate the difference between the amount of that increase and fifteen (15) cents per ton, net or gross as rated, and to the rates so constructed the above increases shall now be added.

Where rates for producing points or to destinations have been based on fixed differentials in cents per ton, such differentials to be maintained, the increase to be figured on the highest rated point or group.

**Ores, Iron:** Thirty cents per net ton of 2000 lb., except that no increase shall be made in rates on ex Lake ore that has paid one increased rail rate before reaching lake vessel.

### Restricts Opening of New Mines

No new coal mines are to be opened in the future until the proposition has received careful scrutiny on the part of the Fuel Administration. It is pointed out that coal is not produced commercially until it is loaded into railroad cars at the tipple. The Fuel Administration is unwilling to approve of the opening of new mines even when labor is abundant, if it appears to the Railroad Administration that it is impossible or inexpedient to furnish the necessary railroad facilities. The procedure in each case where it is desired to open a new mine is as follows:

1. All applications for the development of new mines shall be taken up in the first instance with the railroad upon which the connection is desired, full information in regard to the proposed operation accompanying the application. Four copies of applications and papers are to be filed.

2. Three copies of the application and accompanying papers will be forwarded to the Regional Director for his approval or disapproval.

3. The Regional Director will forward two copies of

the application and papers with his approval or disapproval to the Director, Division of Transportation, United States Railroad Administration.

4. The Director, Division of Transportation, United States Railroad Administration, will submit one copy of the application and papers with the recommendation of the Regional Director to the United States Fuel Administrator.

5. Representatives of the United States Railroad Administration and of the United States Fuel Administration will, thereupon, agree upon the approval or disapproval, and a single notice of the disposal of the case indicating joint consideration and action, will be sent to the applicant through the office in which the application originated.

### Weekly Production Statistics

Bituminous coal production during five days of the week ended May 18 exceeded the 12,000,000-ton rate. A heavy falling off in production on Saturday of that week, however, pulled the figure down to 11,732,000 tons, which was slightly below the performance of the week which preceded. Whether the cause for such a decided falling off on the final day of the week was brought about by lack of railroad cars or by the failure of labor to put in a full day Saturday has not been learned at this writing, but it is regarded as probable that these two factors were mainly responsible. The week which ended May 18 was the first in which there was no car shortage in the Pocahontas and Connellsville districts. Telegraphic advices concerning the week ended May 25 indicate that the performance will be slightly under that of the preceding week.

Anthracite forwardings for the week under review were 41,011 cars, the best showing that has been made in many weeks and an increase of 6 per cent. over forwardings of the week ended May 11.

Beehive-coke production for the week ended May 18 was 678,000 tons, a decided trend upward as compared with the week preceding. Byproduct coke production was 485,076 tons, which is practically the rate of production which has been maintained for several weeks. The industry is being operated at 90 per cent. of full-time capacity. This compares with 69.2 per cent. for beehive operations in the Connellsville and adjacent regions.

The estimates referred to above are those of C. E. Leshner, the geologist in charge of coal statistics for the United States Geological Survey.

### To Stimulate Use of Lignites in Northwest

The oil land leasing bill, which includes in its provisions coal, phosphate and sodium-bearing lands, passed the House of Representatives last week without the necessity of a roll call. The friends of the bill believe that it will stimulate the development of coal and lignite on public lands. During the course of the consideration of the bill Representative Norton, of North Dakota, stated that he had been given reasonable assurance that an experiment station of the Bureau of Mines is to be established in the Northwest which will be devoted exclusively to the consideration of problems looking to a more extended utilization of lignites.

# THE LABOR SITUATION

EDITED BY R. DAWSON HALL

## General Labor Review

The labor conditions were never better than they are today, for the railroads are giving improved service. There is no crop now to move, there are no winter obstacles and no trouble with floods; consequently the railroads are enabled to give a maximum car supply. In the week ending May 4, the railroads in the bituminous region had a car shortage of only 13.1 per cent. and on the week ending May 11, a shortage of only 11.2 per cent. In both periods the mines worked over three-quarters full time.

Unfortunately labor shortage and strikes caused a loss in operation of 5.4 per cent. In some sections the men will not work steadily, largely because they are not sufficiently and satisfactorily appealed to. Public meetings and posters are needed in every place to encourage the workman to do his utmost every day. It may almost be justifiably asserted that we have no posters urging steady work, day by day, and such few as are available are not posted. As the railroads do their duty more thoroughly the opportunity of the operators to urge steady work will be greatly extended and even now a campaign is badly needed in some sections.

### ALABAMA MINERS CANNOT BLAME RAILROADS

Notably among these sections is the state of Alabama with a car shortage of only 0.5 and 0.3 per cent. in the two weeks under consideration. The labor shortage was far more important than the car shortage, namely, 8.3 and 8.8 per cent., respectively, and the strikes added 0.4 and 0.3 per cent. This is a bad showing for the mine forces. The miners owe it to the nation to work so steadily that they will never fail to fill the cars afforded them.

At this time of year the car supply is at its best, but the labor supply is normally at its worst. All the farmer miners are leaving the pick for the plowshare. The mines begin to fill up again in the winter, just at the time when the railroads are least able to haul freight and when transportation is cluttered by the product farmed by the miners and others, especially the others, during the summer. The farmer has some idle days in the warm weather but he does not feel as keen about his mining work so long as there is any need during any given week to work on the farm.

The situation in the Broad Top region is unchanged except that the decrease in the price of coal only makes the operators of that region less ready to make wage concessions. Unsupported by public opinion, the Fuel Administration and the union, the mine workers along the Huntingdon and Broad Top R.R. do not seem to have any great chance of winning their strike.

### COMPARED WITH SOLDIER'S, MINER'S BIT IS SMALL

Philip Murray, the president of the Pittsburgh district (No. 5), at a meeting held at Bentleyville, Penn., denounced the miners who are unwilling to work because they can make a good living when working short time. Murray said "If the soldiers can shed their blood on the battlefields of Europe the miners can work. When the Government and the coal operators agreed to give the miners the greatest increase of wages ever known to organized labor the union leaders gave their solemn promise that the miners would work and insure the Government 100 per cent. production during the war. I beg, I plead with you to get to work and make good your promises to your employers."

United States Circuit Court Judge Joseph Buffington also addressed the meeting, scoring those who would not work eight hours six days a week. He said, "Any man who is able to work and won't work in these times is

putting in that much time for the Kaiser and the Potsdam gang. There is no room in America for idlers or boozers."

In a well-reasoned editorial, the *American Coal Miner* explains why it is necessary that adequate prices be paid to the operator if peace in the labor field is to be attained. It shows admirably the reason for President Farrington's statement, reprinted in last week's *Coal Age*, page 978, that the union would feel unfriendly toward cut-price operators. However, it was not the purpose of the editorialist to discuss Farrington's letter, but to explain why the railroads should not be granted a drastic price reduction. The editorial says:

"Those conversant with mining know well that when operators are operating on scant margins cases of dispute about the payment for yardage, deadwork, setting props, laying rails, etc., multiply, because the mine foreman and superintendents are urged to work for the lowest possible production costs. When payment is demanded for these extras for mine labor by miners, the bosses, realizing the small margin under which they are operating, hold back and endeavor to drive bargains.

"Settlements that could be easily made between mine committees and mine bosses under a fair margin are delayed, carried up to joint boards, arbitrators and commissions, all of which causes unrest, reduces the efficiency of the men directly involved and promotes a general bitterness among the working force."

### HOPKINS' MINERS GIVE RED CROSS A DAY'S WORK

The mine workers and coal companies of Hopkins County in western Kentucky contributed their entire output to the American Red Cross on Monday, May 27. The St. Bernard Coal Mining Co., with offices at Earlington, Ky., which was one of the companies in this generous dedication, operates 10 mines and employs about 3000 mine workers. There are four mines at Madisonville, Ky., that employ more than 1000 men.

In British Columbia, Canada, the Crow's Nest Pass Coal Co., Ltd., and other operating concerns in the Crowsnest region have granted a further increase of 20c. per day to their men. This increase will add to the payroll of the larger company mentioned \$10,000 a month.

### Not Patriotism but Trade Restriction

According to Attorney General Brundage of Illinois, the high wages paid in the mines were the indirect cause of the lynching of Robert P. Prager by a mob at Collinsville, Ill. He says that the state will demand the death penalty for the lynchings at their forthcoming trial.

"The entire trouble," says the attorney general, "grew out of Prager's desire to become a miner in Illinois. He had been working in St. Louis but figured that he could make more money in the mines. Consequently he moved to Illinois and applied for a certificate as a first-class miner. His application for this kind of a certificate was questioned by the officials of the miners' local on the ground that he had not worked four years at the business. Prager had the papers to bear out his statement and brought them forth when the officials called for them. Several days later he was paraded through the streets with a flag wrapped about him, probably because he had made the statement that he had worked four years in the mines in Germany. The parade, however, was in the nature of a joke and everyone was good natured about it. Later it took a more serious turn and ended with the hanging. Absolutely nothing was developed by the investigation to show that Prager was in any way unpatriotic."



The job of juryman in the Prager case is not popular. It was necessary to send deputy sheriffs throughout the county to secure suitable talesmen. The card system of drawing veniremen was discarded. On May 14 68 veniremen had been examined and not one had received the approval of both prosecution and defense, though three men had been tentatively accepted by the state. The accused appeared at court patriotically and conspicuously decked with the national colors.

The tedious process of getting a jury to try the men was little accelerated during the week following. Only eight men were finally accepted.

The greater part of the week was spent in an effort to get the other four. Court adjourned to last Monday, however, without the jury having been completed. Almost 650 talesmen had been examined. In adjourning court Friday, May 24, Judge Bernreuter congratulated the eight men and said he was proud there were eight men in the community who were willing to uphold the honor of the United States. He scored others who, he said, had read about the case after being called, for the purpose of arriving at an opinion and disqualifying themselves for service.

The general disposition has been to excuse farmers from the jury because of the paramount needs of the farm, and miners are probably not acceptable to the state's attorneys because they are apt to be friendly to those who are accused of Prager's lynching. It is hard to find a jury in a farming and mining community when there are reasons for not accepting both farmers and miners. However, on May 27 a jury was finally secured, and the trial commenced.

### Superstition Closes Illinois Mine

One night last week, Charles Sartorius, the watchman at the Peabody mine near Kincaid, Ill., dreamed that someone was stealing the mine's supply of powder. When he awoke he investigated and sure enough there was no powder where he thought there should be some. Furthermore, he discovered at the pit mouth a skull and crossbones crudely drawn on a sheet of paper.

The story got around, and the next day most of the 700 miners stayed at home. They reasoned that the dream, the stolen powder and the skull and crossbones pointed to a plot to blow up the mine. An investigation showed that no powder had been stolen and that the skull and crossbones had been drawn by school boys. Slowly the miners recovered from their alarm and returned to work.

### Should "Targets" Be Hired?

Perhaps it is better to define a "target" before going further, for the reader may not have heard the expression used regarding an employee. A "target" is a man who is, or appears likely to be, a bad risk because he is subnormal, mentally or physically or both, and therefore does not exercise due care at his work. He is likely to be repeatedly injured or, as Kipling would put it, "frequent deceased."

The Kansas City local of the National Safety Council discussed the question at its meeting on May 7 under the head, "How can the increasing turnover be checked, without keeping, in hazardous jobs, men or women habitually careless?" The question is not an easy one to answer in view of the shortage of labor.

One of the largest plant managers in Kansas City stated that he felt under obligation to accept for employment men whom under ordinary circumstances he would summarily reject. He said that it was not only a necessity to get someone to do the work, if only in a fashion, but it was also an obligation to provide everyone with work in view of the need of the war that our whole man-power be utilized. Many of the manufacturers present at the meeting discussed earnestly the ethics of refusing to employ a subnormal workman who needed the work, but could not be expected to fill the place with due efficiency and perhaps not with safety.

### United States As an Employer

Uncle Sam in his capacity as the world's greatest employer is discovering that his workers will not "live by bread alone" and that high wages are not of themselves a sufficient inducement to hold men to their work. He is discovering that men are social beings and that employees must have certain social and community facilities if the daily job is to content them.

In a certain district two great munition projects are located. One of them, lacking almost everything in the way of recreational and welfare facilities, has had a labor turnover of many hundred per cent. The other with identically the same work and the same rates of pay has had no such turnover. The reason evidently is that the latter plant is located on the edge of a city whose social facilities while meager have yet been sufficient to bring into the lives of the men that social contact with one another for which we all instinctively crave.

At nearly all Government projects the wherewithal for recreation and social welfare is being-put under way. Community huts are being erected where men may meet and play their games, where they may smoke and spin yarns and build that invisible, intangible something known as esprit-de-corps. Moving pictures are being provided and are attracting increasingly great audiences, and it is an interesting sidelight that the most popular pictures are of current events and not of the slapstick variety.

Reading rooms with books and magazines are being furnished for those studiously inclined. Baseball diamonds and tennis courts and up-to-date equipment are being built and baseball leagues organized. Lectures and concerts are to be provided from time to time and bands are being formed and equipped. Y. M. C. A. men are in charge in some of the large projects and ordnance welfare executives are being provided at others. Health conditions are being improved and at one project the U. S. Public Health Service is undertaking a clean-up resembling that so efficiently inaugurated at Panama.

In short, Uncle Sam is following the example of other great employers of labor and undertaking to keep his men sound in mind and body and watching with a jealous eye their comfort, convenience and happiness.

Another interesting phase of work which is being undertaken by the Ordnance Department through the Community Organization Branch of its Industrial Service Section is to work hand in hand with groups of citizens in those cities containing factories producing munitions, to eliminate those community conditions which may be adversely affecting the welfare of labor.

Many of these cities are so congested by war workers that they are unable to furnish community facilities for the newcomers. Part of the program to be worked out in such cities by the Community Organization Branch is as follows:

"Campaign of patriotic education to impress upon workers that they are the second line of defense and that their efforts are absolutely essential to the safety of the men in France and to the winning of the war. Formation of housing companies and of building-and-loan associations and the encouragement of home-building by individuals. Extension of trolley tracks to new districts and increased service. Extension of water, sewer, gas and electric service to the new housing districts. Ordinances to prevent the exploitation of the workers. Nearby farmers encouraged to grow produce, and public markets installed for producer and consumer. Provision of facilities for plowing and harrowing home gardens. Installation of branch libraries for convenient use of new workers and their families. Erection of community center "huts" with moving pictures, supervised dances, concerts, lectures, etc. Increased school facilities for children of new workers and night school during winter months for adults. Control of alcohol and social evils, and education of workers by medical specialists. Complete Americanization movement for naturalization of aliens, and instruction in history and citizenship. Education of workers, their families and especially the children to the need for thrift, and the complete utilization of the workers' time.

## EDITORIALS

### Canada's Difficult Coal Problem

CONDITIONS have been so vastly changed by the war that nations which formerly wished to exclude foreign products are now most anxious to receive them and are satisfied if they receive all that can well be spared. Canada, which regretted the fact that it had to buy coal from the United States, is now troubled because it seems probable that we will not have enough for ourselves to do our full part in supplying her.

Nations are dependent one on another. Whenever all tariffs are revoked they buy of one another just as if there were no lines of nationality. It is well for Canada to zone itself with the United States in peace and in war, contiguous areas in both dealing with one another to their mutual advantage without considerations of national lines. That section should perform the service that can do it with the least labor. If with the least labor the United States coal can reach Ontario, then Ontario is a market for United States coal. On the other hand if Boston can be better reached from Canada, then the Canadian coal has the better right to purchase.

Most nations today are worrying more that they won't be shipped enough than that they will get too much. In our great need we do not look over closely at the source. The "Made in America" cry has gone by the board with "Made in Canada" and "Made in Great Britain." What we want we must have, no matter whence it comes.

Could we believe in 1914 that the representative of the Canadian government would say in 1918 that "in the regulation of the supply of American coal to meet this year's requirements of both the United States and Canada the United States authorities had generously provided that there would be no discrimination against Canada, which in this respect would be treated as if it was part of the Union"? "This decision," says the Canadian Mining Institute Bulletin, "is further proof of the close and fraternal relationship that exists between the two countries; but if for no other reason than a desire to impose as little as possible on the goodwill of our neighbors, when such imposition may mean hardship to them or the impeding of their war efforts, our demands on them for coal should be limited strictly to imperative needs that cannot otherwise be satisfied."

This statement does not accord with the belief that every nation is ringed about with economic enemies. When will we learn that we can only receive satisfactory service by accepting it from those who are qualified by nature and propinquity to render such service? May the sentiments fostered by the war in our neighbor and ourselves last long after the war, and let the man who in the United States burns Canadian coal be as well satisfied as he would be if he knew the fuel came from a neighboring state.

No nation can become wealthy by buying material made under disadvantages or produced in a remote location, even though produced on the national terrain and hauled on the nation's railroads. It must buy where production is easy and the haulage cost is light. The world needs zoning, but in the planning of such zones the national lines will be of continually decreasing importance. The buyer and the seller are both benefited by trade, as we soon learn to realize when the seller refuses to sell. It is a relic of an old world this idea that the seller should carry his hat in his hand. He needs the buyer, it is true, but at times not nearly so much as the buyer needs him.

### Coal, Like War, Waits on Transportation

FOR a long time the main problem of the war has been to determine how the Allies in Europe were to be fed and our armies sustained at the front with our ocean transportation threatened with a complete breakdown by the continued and powerful assaults of the German submarines. The problem is by no means solved even to-day, and the scare we have had has left us with little of the former complacency.

The coal situation is much the same. We have the men, at least to a large extent, and we certainly have the producing facilities for the largest possible demand for coal. We could supply ourselves with all the coal we need and at the same time provide our allies with all the fuel needed to supply their deficiency. With our capacity we might even supply Great Britain with as much coal as it is now producing—if we could only haul it on the railroads and find place for it in the holds of our vessels.

The public has been much comforted by the fact that nearly a billion dollars is to be expended by the Railroad Administration on new equipment and betterment. A billion dollars seems a smaller sum of money than it did a few years ago. But even in days when few used to think in billions we used to spend that billion without really knowing it. A great, big overgrown nation, we did not reckon just what our total expenditures were. We bought in small units. There were many corporations, and most corporations distributed their purchases through the year. Thus a large aggregate tonnage was purchased without it being considered large.

But now the public has its enumerating done for it. The Government is doing its own buying. It does it all at one time in the year, at least, it estimates in that manner, and it does it for all the railroads at once. The public is interested and sympathetic, as it always is in the work of the Government, and it is therefore quite ready to declare that the expenditure planned is stupendous and to anticipate that it is adequate to all the Government needs. It is needful, therefore, that we view the proposed expenditures critically.



The first important need to be met is locomotives. The new order will only add 1½ per cent. to their number, for there are 65,000 locomotives now in use. The new locomotives, however, will be larger in size and greater in power than the average locomotive now in service. They will probably do twice as much work, and for this reason the addition to the tractive ability of the railroads will be approximately 3 per cent. With this "stupendous" program the locomotive equipment would be changed every 33 years. Thus, under such a plan, locomotives of 1885 would just be ready for retirement; and if this percentage of new construction had been followed steadily since 1885, our transportation facilities would either be on the low basis of that year or we would still be using locomotives used during the Civil War.

The car program is more generous. The number ordered is 100,000, representing an increment of 4 per cent. to the 2,500,000 cars now in use. As the cars will be larger than the average now in service, we may say that the increase in capacity will be roughly 5 per cent. With this program we shall prevent a positive reduction in our freight-carrying equipment only by making it last a full 20 years. There will be no increased capacity unless we make the equipment last longer. Advance in the design of railroad equipment will never be rapid with such niggardliness in renewals. Even in the worst years of the railroads the car purchases have been larger. For years, when traffic even seemed to show signs of temporary decline, the railroads purchased more than the 5 per cent. of car equipment that is now quite generally extolled as amazing.

The *Railway Review* says that "for more than six years they [the railroads] have averaged car orders 50 per cent. greater than the 'control' has now put out"; and again it says, "As a mere matter of fact the Government is ordering two-thirds as much equipment as the railroads did in the year of their greatest distress under oppression, and less than half as much as they have averaged through the years of feast and famine."

As another authority points out, the whole billion dollars, or rather the \$937,961,318, for that is the real sum, is only 6 per cent. of the existing capital investment in stations, terminals, roadway and equipment. Furthermore, the Associated Press dispatches lead us to doubt whether this 6 per cent. will be spent in adding to railroad facilities. "The figures," says the report of that agency of the press, "disclose Director General McAdoo's determination to let the railroads make many improvements which they had neglected during the last three years, through permitting tracks to run down and postponing all possible projects requiring big expenditures of capital." Evidently, if they disclose this purpose they do not offer hope that much of the necessary new work will be done.

In 1907 J. J. Hill advocated that at least \$1,100,000,000 be spent annually for new construction and improvements, in order that the transportation interests might be kept abreast with industrial progress. Today \$2,000,000,000 would scarcely do what \$1,100,000,000 would have done in 1907.

Of course, Mr. Hill had in view construction such as could not patriotically be advocated during the war. This is conceded. Another concession may profitably be made, which is that Director General McAdoo prob-

ably believes that any program larger than he has written could not well be enacted in the twelve months of a single year with the world at war. He may well be justified in his decisions. Nevertheless, it is needful that the public generally, and especially the suffering coal industry, realize the narrowness of the program the Railroad Administration has, rightly or wrongly, decided to adopt.

### Give the Hat-Boy His Tip

THE recent lowering of bituminous coal prices one dime per ton will be viewed quite variously; but, however viewed, the coal companies will loyally accept it. Some will feel it is hard to have to give a dime to the railroads and the public in order to secure that justice which is everybody's natural right. The dime will look like the *douceur* that we give to the hat-check boy. It will be said that the coal industry will be compelled to pay about \$60,000,000 a year to get justice from the railroads. They cannot give adequate service, of course, but the service they give from now on will be evenly distributed. Pay your tip or the service rendered the coal industry will, in the future, be uncertain and irregular.

On the other hand, it must be admitted that the United States Fuel Administration in fixing coal prices may have visualized the possibility that the railroads, even though federalized would, as in the past, have "ways that are dark and tricks that are vain" and may have sought therefore to protect the coal companies by a degree of liberality in the fixing of prices. Or to put it more exactly, the figures of operating cost furnished to the United States Fuel Administration were based on actual and not on ideal working conditions, and the Fuel Administration has felt itself justified in believing that a little steadier work as an outcome of greater equity and more efficiency in railroad operation would result in reducing those costs.

The quarrel is at an end. The Railroad Administration promises to be good. If it starts buying coal as fast as coal may be obtained and tries no more shenanigans we can forget its past delinquencies, for the coal trade also has some things it would like to have forgotten. There is that little matter of dirty coal, for instance.

### White Goes on Labor Policy Board

THE United States Fuel Administrator announced, May 28, that John P. White, the labor advisor to the Administration, was appointed representative of the Administration on the Labor Policy Board of which Felix Frankfurter is chairman. We wonder what the attitude of the industry would have been to such an appointment before the war and before it had its recent opportunity to know and appreciate Mr. White. It would certainly have said that at least a man like Rembrandt Peale should be added to provide a balance.

But since the war commenced Mr. White has shown clear evidence of his saneness of outlook and uprightness of purpose. Despite the fact that it cannot be denied that he represents only labor, he is sure to be regarded not unfavorably by capital. The policies he will advocate will doubtless be those he has elaborated with Rembrandt Peale and the Fuel Administration.

## DISCUSSION BY READERS

### Success in Mine Management

*Letter No. 2*—Reading the excellent article of W. W. Beddow, *Coal Age*, Apr. 27, p. 778, again calls up the question of what constitutes a successful manager of mines. Attention was first drawn to this matter by R. W. Lightburn in his letter, Apr. 13, p. 707.

As someone has already pointed out, the mine official who succeeds in holding his job and is successful in producing results is a man who is bigger than his job. While there are many thoroughly capable mine officials, there are many others who fail in a very vital point.

Success in management always involves the providing of suitable equipment that will enable the men to work efficiently and which will insure the production of the required output at a minimum cost. The failure to do this is common not only to the higher officials, but to those whose duties bring them into intimate contact with the daily operation of the mine. The principles that concern success apply equally to the higher officials and to their subordinates.

#### FROM MINE FOREMAN TO SUPERINTENDENT

One difference that is plainly noticeable to the close observer is the change that comes over the average mine official as he rises in the company and assumes a higher office. In his new position, a superintendent is not as anxious to secure improved equipment or undertake certain improvements in the mine that, as foreman, he was very anxious to secure.

Every foreman has an ambition to be progressive and is constantly recommending the most up-to-date equipment possible, because he realizes that the work of mining coal and hauling it to the shaft bottom can be greatly advanced by the employment of better methods and improved equipment.

As superintendent, however, the man's ideas seem to have undergone a change. He now views things from a different standpoint and is not so anxious to increase the cost-sheet by the purchase of new equipment or by undertaking the improvements recommended by his foreman. He appears to have forgotten his previous experiences in the mine, when, as foreman, he saw the need of these things, and falls automatically into the well-beaten path of his predecessor in office.

To the average mine foreman who is anxious for advancement, good equipment is a necessity; but with many superintendents, general superintendents and managers, any old equipment is good enough, provided the mine cars can be kept bumping over the rails, the locomotives continue to haul a fair tonnage, and the mine is not compelled to shut down too often for repairs. As long as the mine can be kept running fairly well, and their excuses for occasional failures are accepted, these higher officials are completely satisfied.

Many men fail to realize how much greater things they could accomplish by retaining the same progres-

sive spirit that animated them when they occupied a lower position in the scale. I would not like to style this disposition of the higher official as a growing stinginess. I am inclined rather to explain it by saying that, in their higher position, the said officials are farther removed from observing daily the actual necessities of the work underground.

Managers are more concerned with the appearance of the cost-sheet and often forget that a low cost of operation can only be maintained by devoting a reasonable amount to improvements in methods and equipment. The foreman is, as we say, up against hard facts. He is pressed for a larger production at a reduced cost, while he is denied many things that are essential in order that he may make a good showing in the mine.

In reading the different articles in *Coal Age* that bear on this subject, I have been impressed with the fact that the majority of the men in charge of smaller operations do not have the vision that marks men for the highest attainments. This will even apply to many men in charge of larger operations.

In this connection, let me say that it would be a fine thing if some of the practical readers of *Coal Age*, who are in intimate touch with mining needs, would discuss the need of broader vision in securing a greater production of coal at a minimum cost of operation.

Let us see if we can ascertain why some men are more farsighted than others whom they have outdistanced in the race and have thus proved that their ideas are well worth while. Believing that these thoughts are of vital importance to successful mine management, I hope for a discussion that will broaden our vision and give us greater success in the management of mines.

—, Penn.

OPTIMIST.

### Loading and Shipping Clean Coal

*Letter No. 7*—Much has been written regarding the shipping of dirty coal and showing the large loss to the consumer, due to being compelled to burn coal containing a high percentage of refuse. This loss occurs not only from the low heat value of the mixed coal and refuse, but because of the additional expense of disposing of the large quantity of ash, to say nothing of the freight charges paid for such material.

A difference of opinion seems to exist, on the part of writers, in regard to who is responsible for the loading of this refuse with the coal. A few blame the mining companies for a laxity of discipline, while many believe that the miners are the parties most to blame. It is probable that both the operators and the miners contribute their share toward the difficulty.

We all know that the miner can increase his earning capacity by not taking the time necessary to remove the bony coal and slate. He not only gains in time and is able to load more cars, but increases his daily tonnage by the weight of refuse he loads with his coal.



Many of the coal companies allow this practice to proceed and offer little restraint, fearing the loss of good miners if they are too strict in their requirements in the mine. A few operators may even consider that the shipment of dirty coal will command the same price in the market, at the present time. They also realize that less experienced miners can be employed where the quality of the coal loaded is not a matter of so much importance.

There is an old saying that "Every cloud has a silver lining." The "silver lining," in this case, may prove to be the education of consumers, who learn how to burn lower grades of coal than that to which they have been accustomed. While this may require practice in firing and the installment, at times, of equipment better adapted to burn coal of an inferior quality, it will have the beneficial effect of conserving the better grades of coal and utilizing that of poorer quality.

#### APPEARANCE NO INDICATION OF QUALITY

In the past, much prejudice has existed against coal that did not present a good appearance, though being of a fair quality. Some consumers would even refuse to give a rusty or muddy-appearing coal a trial, and looked askance at the bright colored peacock coal.

In Maryland, for many years, the only coal accepted by large plants was the best portion of the Pittsburgh or "Big Vein." But, as this seam approached exhaustion, these large consumers became less particular and soon discovered that all of the seam was of good quality. Later, they were glad to get both bottom coal and peacock coal, and, more recently, the same plants have been altered to burn outcrop coal, and many have been willing to take coal from other seams.

In the great demand for coal last winter, much of the extreme outcrop coal was stripped and loaded for market. Recently, strange as it may seem, the chemist of a large public-service corporation, in an eastern city, stated that the quality of this outcrop coal was remarkable. He said that, to see some of it on the railroad cars, one would think that it would be more likely to extinguish a fire than to maintain combustion.

In working the lower Kittanning seam, in West Virginia, several years ago, it became necessary to stop all places where the coal looked rusty or, as frequently happened, was partly coated with a thin fireclay mud. If but a small quantity of such coal reached the car, a complaint might follow or the shipment even be refused.

A recent analysis of this rusty and muddy coal, however, showed that the complaint was unnecessary, as the supposed low quality of the coal was imaginary and not real. Three types of this coal were analyzed; "A" is an average of fifteen analyses of glossy black coal, as usually shipped; "B" is an average of five analyses of muddy coal; and "C" an average of five analyses of rusty coal. They are as follows:

	A	B	C
Moisture .....	0.82	2.14	1.99
Vol. carbon .....	21.86	23.66	23.68
Fixed carbon .....	70.08	67.88	66.90
As. ....	7.24	6.32	7.44
Sulphur .....	1.10	0.74	0.85

It will be observed that with the exception of a varying moisture content, the difference in quality of these coals would hardly be sufficient to justify a com-

plaint being registered when a small quantity was found in a shipment.

In closing, permit me to suggest that, while the loading and shipping of impure coal is to be deplored, there will result eventually some compensation, should consumers learn to judge a coal by its actual quality, as determined by analysis, and not be prejudiced by the appearance.

J. A. SMITH.

Albert, W. Va.

*Letter No. 8*—I am of the same opinion as W. H. Noone, who states in his letter, *Coal Age*, Apr. 20, p. 754, that "the shipping of slate and rock for coal is nothing more or less than an act of treason." Any operator found guilty of shipping an inferior quality of coal to the Government, for use on shipboard or in munitions factories, at this time, should be regarded as a traitor and his mine taken over by the Government.

I am inclined to have more sympathy with the miner when the conditions in his working place make it difficult for him to avoid loading more or less of bone and other impurities with his coal. Further, the miner is often obliged to speed up in loading his coal, so as to keep the drivers running, which gives the miner little time for a close inspection of what he loads. I have always claimed that the cleaning of the coal could be better done by daylight than in the mine where the miner is often deceived by the uncertain light of his lamp.

#### COAL BETTER CLEANED ON THE SURFACE

In order to clean the coal properly, at the surface, it would be necessary to install a suitable picking table, onto which the coal could be dumped as it comes from the mine. A sufficient number of boys must then be employed to pick out the bone and slate from the coal as it passes them on this table. At some mines, the miners have agreed to allow a deduction of 10 per cent., or 20 lb. to the ton of coal sent out of the mine, to pay for the employment of slate and rock pickers. They have also agreed to let the company dock them 100 lb. when the rock and slate in a single car exceeds 10 lb.

This method, however, has not proven generally satisfactory to the miners, because of the opportunity it offers for dishonesty on the part of the company, unless a checkweighman is employed. Where there is no checkweighman, the miners are apt to say "We are paying for the rock, so let her go."

In my opinion, it would be an advantage to appoint a coal inspector at each mine, whose duty it would be to visit every working place in the mine and instruct the men showing them the difference between the coal and bone and rock or slate. Let him secure some of the bone, slate and rock that have been picked from the coal sent out of the mine, and warn the miners by telling them what injury they are doing the mine when they load out such refuse. He should show them that they are running the risk of a shutdown of the mine by reason of the shipment of coal of an inferior quality.

When miners continue to load out rock and slate that should have been easily detected in the mine, it would be better to get rid of them without further delay. At

the same time, the men who load clean coal should be informed that their work is appreciated. Such a system has been followed at the mine where I am employed and I understand that the traveling coal inspector has stated that the coal coming from this mine is of better quality than for years before.

It is the patriotic duty of the miner who mines the coal, the operator who ships it to market, and the dealer who makes the final delivery to the consumer, to see that the coal is clean and of good quality. The consumer, on his part, must not be too severe when he finds a shipment to contain some impurities. He should notify the dealer or the company of that fact, making due allowance for the urgency of the present time. We must all make large sacrifices in the great cause for which we are striving; namely, that the earth shall be a better place in which to live.

Farr, Colo.

ROBERT A. MARSHALL.

## Gathering Motors

*Letter No. 4*—I have been an interested reader of the letter by "Motorman," who describes in some detail the different types of gathering motors that have been used in mines, *Coal Age*, Apr. 27, p. 800. Although the letter draws attention to several good points, I am compelled to differ with the writer in his view regarding the relative value of the combined trolley and storage-battery locomotive, which he seems to regard as a revolutionary step forward in gathering-motor practice.

There is hardly a question but that almost any form of storage-battery locomotive is an improvement over the old cable-and-reel motor. But, since the storage-battery locomotive has come to be an accomplished fact, by reason of its mechanical perfection and the durability of its batteries, let me ask, Why is it necessary to add the trolley attachment?

In the large number of mines that have installed storage-battery locomotives for gathering purposes, they have been found to perform every function of which the old cable-and-reel motor was capable. In all cases, the battery locomotive has given good satisfaction and performed the required work, except where the machine has been compelled to haul poorly built mine cars. From every standpoint, this type of gathering motor has proved efficient and economical.

The most successful installation of storage-battery locomotives that I call to mind at present is in a mine equipped with high-grade, roller-bearing mine cars. In an exhaustive test, it was demonstrated that the drawbar pull necessary to haul mine cars equipped with this type of bearing is reduced by 50 or 60 per cent.

### NO NEED TO BOOST BATTERIES

We learn, also, that where storage-battery locomotives are used to haul roller-bearing mine cars, no time is necessary for the boosting of the batteries, as suggested by "Motorman" in the letter to which I have referred. When hauling these cars, the batteries have been found to perform their function with complete satisfaction throughout the entire shift, and the charging is done entirely at night.

It is true, as "Motorman" has stated, that when the charge of a storage-battery locomotive is about half

exhausted, the drop is much more rapid in the latter half than the first half of the shift. However, no serious depletion of the charge of the batteries will occur if they are not subjected to the heavy drain caused by starting a trip of plain-bearing cars.

Cars equipped with roller bearings, it has been found, can be started with only 40 per cent. of the power required to start plain-bearing cars, and there is far less drain on the batteries from this cause. Stated in another way, the average plain-bearing car is two and a half times as difficult to start as the roller-bearing car of the same size and under the same conditions.

### TRACK RESISTANCE GREATER HAULING EMPTIES

While speaking of hauling trips of mine cars equipped with different types of bearings, kindly permit me to mention one fact that is not generally known; or, if known, is often overlooked when laying out the main haulage road in a mine. Engineers ordinarily give the main road a grade in favor of the loaded cars, but often fail to take into account the fact that if the cars are equipped with plain bearings the track resistance of the empty trip is increased by 40 per cent. over that of the loaded trip. It is interesting to know that if the cars are equipped with the best type of roller bearings, the track resistance for the empty trip is only 15 per cent. greater than that for the loaded trip.

These facts are of vital importance whenever a storage-battery locomotive is used on the main haulage road. As is well known, it frequently becomes necessary to start the empty trip on the upgrade where it has been halted by some obstruction on the track. These considerations should all be taken into account in estimating on mine haulage conditions.

As is generally believed, the success or failure of any gathering haul depends almost entirely on the condition of the track, the kind of mine cars and locomotives used, and the knowledge and skill of the motorman. In speaking with a prominent mining man, only a few days ago, he expressed the opinion that it will not be long before every mine manager, having an eye for the future, will insist on the installation of roller-bearing mine cars and storage-battery locomotives.

Pittsburgh, Penn.

STORAGE BATTERY.

## Observation of Sun for Latitude

*Letter No. 2*—Kindly permit me to draw attention to what seems to be the omission of a line, or a few words, from the last sentence of the letter of Prof. Howard Eckfeldt, *Coal Age*, May 11, p. 891. Speaking of "parallax," the statement reads, "Allowance must be made for the semi-diameter of the sun; but, as the resulting parallax amounts to but a few seconds of arc, it is usually ignored in this observation."

It is well known that the semi-diameter of the sun, as observed from the earth, covers an angle of about 16 min. Professor Eckfeldt has just stated that allowance must be made for this when observing the disk of the sun instead of its center. It is evident, therefore, that the allusion in what follows is the parallax resulting from taking the observation from the surface of the earth instead of its center.

This error of observation amounts to but a few seconds of arc, and, as stated, can usually be ignored.



Parallax, for the sun, never exceeds 8.8 sec. of arc, so that when using a transit whose vertical circle reads only to minutes, this correction is inappreciable. [Our thanks to Professor Callen.—Editor.]

While writing on this subject, permit me to refer to the suggestion made by H. M. K., in his inquiry, *Coal Age*, May 18, p. 943, in regard to constructing a chart that would read to a larger scale than the one designed by J. T. Beard, which appeared in the issue of April 20, p. 733. The suggestion made is that the chart should read to minutes of longitude and half hours of time, etc.

A moment's reflection will convince anyone that the actual longitude of the observer is not the important factor, unless the observer's watch is set on *sun time*. It is customary, however, to use *standard time* when taking an observation; and, this being the case, the change in declination of the sun from Greenwich noon, as tabulated in the Ephemeris, must be reckoned to the longitude's meridian for which the observer's watch is set.

For example, if the watch is set for Eastern time, the observer must reckon his longitude as 75 deg. W. from Greenwich. If his watch is set on Central time, he must estimate the difference of time to longitude 90 deg. W., remembering that the change in declination, from that given in the Ephemeris, depends only on the difference of time between the observer's watch and Greenwich noon.

A. C. CALLEN,

Prof., Mining Engineering,

Morgantown, W. V. West Virginia University.

## Safety in Shotfiring in Mines

*Letter No. 4*—I am much in favor of the employment of shotfirers to charge and fire all shots in mines, instead of leaving this work to be performed by the miners. The shotfirers should be experienced men having the training that will enable them to determine correctly the amount of explosives that must be used to bring down the coal, in any case.

Where miners do this work themselves, the hole is often overcharged, or a frozen cartridge is inserted, which fails to explode and later finds its way into the car and possibly into the furnace. The work of blasting in mines is dangerous, unless it is properly performed by experienced men.

There is another feature to this question, however, that is likewise of importance. Attention has been drawn, in previous letters, to the danger of the presence of enemy-alien miners, employed in our mines, during the progress of the war. To my mind, their presence in the mines is a serious menace. Even though the enemy alien himself may intend no harm, he may have one or more men working near him who have taken a dislike to the man and are only too willing to seize upon the opportunity presented by the war to make trouble for him. They may even go so far as to place dynamite in his car, in order that it may be found and blamed to him as a disloyal act.

In time of peace, the finding of an occasional stick of dynamite in a car of coal would be regarded as an accident or due to carelessness on the part of the miner, who would be reprimanded and cautioned not to let it occur again. In time of war, however, such an occurrence is attributed at once to disloyal intent.

While I wish to be fair to all enemy aliens who are loyal to this country, I feel that there is much risk in letting this class of men work in our mines. It would be better, in my opinion, to employ them at other work that will afford them or others no opportunity of doing a harmful act.

C. MCMANIMAN.

Rawdon, Canada.

## First Aid to the Uninjured

*Letter No. 6*—I have been much impressed in reading the letters that have appeared in *Coal Age* on this subject and cannot resist offering a few comments regarding our attitude toward all first-aid and safety-first work.

A short time ago I was looking over the anthracite mining laws of Pennsylvania and noted with interest the ample provision made for the care of the injured, in Art. 7, which gives in detail the kind of ambulance, stretchers, etc., that must be kept at the mine, in readiness for immediate use in case of accident.

The thought struck me, in this connection, that before the benefit of this wise provision can be fully assured, how important it is to give the necessary instruction to all classes of mine workers, in order to enable them not only to give the necessary first aid to an injured fellow worker; but, more important than all, to impress upon every man this idea of rendering *first aid to the uninjured*, and thus enable them to avoid these accidents.

In the giving of first aid to the injured, it must be remembered that, while the up-to-date motor ambulance is a great improvement over the old-time method of hustling an injured man over a rough road in an old black, springless, unventilated wagon half-filled with straw, and wrapping him for the time in old blankets that are scarcely fit to keep the mule warm that draws the wagon, these improvements will be of little aid unless the attendants understand how to treat the injured man successfully.

Unless a broken leg is first placed in a rigid position between splints, a well-appointed ambulance will not prevent what was originally a simple fracture from being aggravated in a manner that will necessitate the loss of the injured member. Likewise, improved appliances will not prevent a man bleeding to death if his fellow workers do not understand how to control the loss of blood from a severed artery.

### OPERATORS AND MINE OFFICIALS, TAKE NOTICE

In the giving of first aid to the uninjured, I want to ask, Do our mine officials realize the importance of giving their men needed instruction in the treatment of possible injuries? Observation shows that, in many cases, because of the lack of foresight and the provision of this needed instruction, many lives have been lost, at our mines, that could have been saved had fellow workers known how to treat the injured ones.

A while ago, while walking one of the streets of Wilkes-Barre, my attention was attracted to a group of people standing about an old black ambulance wagon drawn by two mules that apparently could not proceed faster than a walk. Inquiry of the driver elicited the sad fact that a miner had bled to death.

In one of the Bethlehem steel mills, some years ago, there was started a first-aid and ambulance association.

The effort was attended with such success that the plan has now been extended to every mill and foundry of the company; and there is, today, not a department that cannot muster eight or ten men who are capable of attending an injured man properly.

Following an accident in one of the largest collieries in the anthracite field, I suggested to the foreman that a first-aid and ambulance association be organized for the purpose of instructing the men in giving necessary first aid in case of accident. I stated that men could be taught how to put a broken limb in an easy position, arrest bleeding from a severed artery, apply artificial respiration to those overcome by gas, or treat men rendered unconscious by electric shock.

#### UNWISDOM OF A MINE FOREMAN

Much to my surprise, however, the foreman argued that such a scheme, while a good one, would not be approved by the doctors and he refused to consider it further. Experience in later years has proved the fallacy of his contention; and doctors, today, take great interest in assisting to give the needed instructions in first-aid work to all mine workers. It must be remembered, of course, that the first thing to do, in case of a serious accident, is to send promptly for the doctor, while, at the same time, doing everything possible to prevent further injury and save life.

I recall an instance that occurred in the Wyoming Valley, some time ago, when 13 men were overcome by the afterdamp of an explosion, in a fruitless attempt to recover the bodies of two of their comrades who were killed by the force of the explosion. At such times many brave men are ready to risk their own lives in the hope of rescuing their less fortunate companions and restoring them to their families, who are on the brink of despair by reason of the accident. Here is where first aid to the uninjured would be valuable, in giving to these willing rescuers a knowledge of the danger incurred by going unprotected into places where an explosion has occurred.

FRED B. HICKS.

Kingston, Penn.

## Favoritism in Mine Management

*Letter No. 6*—Speaking of the reasons that guide corporations in the choice of men to take charge of the several branches of their business, if every official who has the authority to choose his assistants was asked to give a reason for his choice, the replies received would be almost as varied as the men chosen.

One official will describe the man of his choice as "a young man who has the pep, push, vigor and vim to make things go." No doubt this is true as far as it goes. There are many men who can "make things go," but they do not always go right; and when things go wrong, someone will ask, "What are you going to do about it?" Let me say, the only thing to do, in that case, is to get a new man and try again.

A number of years ago I knew of a coal company who made it a rule to change their mine foremen at frequent intervals. The company operated a number of mines. At one mine, I remember that everything seemed to go wrong. The superintendent of the mine was a boy 20 years of age, who had been a timekeeper.

The mine foreman was a young man of more than average attainments, but, like the superintendent, lacked the experience that one in his position should possess.

Both of these young men had plenty of push and go. Under their management, things moved, it is true, but the movement was not a steady march to success. Instead, things moved rapidly from bad to worse and, to save the situation that was fast becoming intolerable, the company decided on a change of mine foremen, which was then made nearly every month.

#### INEXPERIENCED MANAGEMENT BANKRUPTS THE COMPANY

It is not strange to know that the result at this mine was a failure and the company went into bankruptcy. We are often led to ask why so many industrial concerns choose to employ young, untried and inexperienced men in an official capacity. Is it from a mistaken idea of economy? Can anyone think, for a moment, that the small amount saved in salary will compensate for the great loss that must result from the lack of experience on the part of the one given charge of the work? Efficiency and every vital consideration appear to be overshadowed by one idea, which the management are slow to realize is a false economy.

There are numerous instances about us where men are appointed to fill official positions more from the view point of *who* they are rather than *what* they are. A man may stand high in social and political influence and know little or nothing about coal mining; and yet, how frequently such a one is chosen for an important position by a large corporation, when the work he does most efficiently is to draw his salary. Like the wise old owl, they never talk because they could not instruct if they did. Someone must act for them at every turn.

#### APPOINTMENT OF FAVORITES

In his letter, *Coal Age*, Apr. 6, p. 644, Richard Bowen says, "I do not think that any sane manager would place a man in a responsible position because he was a favorite in some respects." In this opinion, I cannot agree with Mr. Bowen. Whatever may appear as not reasonable, in this respect, the fact remains that such appointments are constantly being made by persons whose sanity has never been called in question.

Mr. Bowen, also, appears to have some curious ideas in respect to the practice in coal mines, in England. It seems strange to me where or from what source he could have obtained his information. In my opinion, he has been woefully deceived in respect to the conditions that he states exist in the mines of that country.

When we compare coal mining in this country with that in England, it would appear that we have done little more than to tag on behind. There is little that seems to me to be of original character in American mining, but we have thought out and accepted British ideas and made use of their experience in forming our mining laws, as well as in other matters relating to the operation of mines. In other words, we have been following in the footsteps of our English cousins. There is no doubt but that we have the men and the brains and should follow our own initiative.

Confluence, Penn.

H. E. GRAY.



## INQUIRIES OF GENERAL INTEREST

### Mine-Car Door

In the hope of obtaining some good suggestions from readers of *Coal Age*, allow me to present, for their consideration, a proposition that is causing us some study and thought. Our miners are loading only hand-picked lump coal, which is mined in large chunks and must be loaded into the mine cars where the seam is not more than 38 in. in height.

Up to the present time we have used cars without doors, but operating conditions make it necessary now to equip all cars with doors. The door must be such that it can be laid flat while the car is being loaded and quickly put in place by the miner before the car is finished. At the same time, the door must be adapted to the requirements of a self-dumping cage and must be in a position to clear when returning into the mine.

Russellville, Ark.

V. C. ROBBINS.

We gladly submit this question to our readers and hope that they will be able to make some good suggestions.

### Taking Anemometer Readings

When taking anemometer readings in an airway that is wider at the bottom than at the top, having the form of a trapezoid, how should the anemometer be held, in order to secure an average reading for the entire cross-section of the airway? I have in mind an airway that measures 8 ft. 4 in. on the bottom and 6 ft. 8 in. at the top, while the clear height of the passageway is 4 ft. 4 in. Will a reading taken in the center of this airway give the average velocity of the air passing?

—, W. Va.

ASSISTANT FOREMAN.

The fact that this airway has the form of a trapezoid, and is wider at the bottom than at the top, does not materially affect the manner in which the anemometer readings should be taken, in order to secure an average reading for the airway. As has frequently been explained in *Coal Age*, the velocity of the air current is always greatest at or near the center of the airway, except where the conditions are such that the air has a tendency to hug one side of the airway, as in a sharp bend, or where certain conditions may cause the air to travel in larger quantity along the roof or the floor of the airway. These conditions have been fully explained in reply to the inquiry on "Measuring Air Velocity in Mines," May 4, p. 848.

In measuring the velocity of an air current in an airway having the shape of a trapezoid, we would suggest holding the anemometer an equal time, say a foot off the bottom and twice that distance below the roof, at points a foot or so to one side of the middle of the airway. Under ordinary conditions this may be expected to give a fair average reading in a 5- or 6-ft. airway.

As previously mentioned, however, it is of more importance that the same method be followed, each time, and that the readings be taken in the same place in the airway, in order to secure relative uniformity in the results. It must be remembered that velocity readings taken with the anemometer in an airway are only approximate, but the readings taken from time to time should be such as can be compared, for which purpose the method of taking the readings must be uniform.

### Mixed Explosives in Blasting Coal

Kindly explain what is the danger in charging both powder and dynamite in the same hole when shooting slate roof in a mine. I have been doing this for several years with good success; but recently our mine foreman informed me that the district mine inspector gave orders that the practice must be stopped, as it was dangerous.

PRACTICAL MINER.

Dubois, Penn.

The mine inspector is right. The habit of some miners of placing a small piece of dynamite in the foot of the hole, before inserting the powder cartridges is a dangerous practice. The purpose of the miner is to break the coal at the back of the shot, hoping thus to obtain a larger fall of coal than would be produced by a charge of powder alone. He claims that the quicker and stronger action of the dynamite, at the toe of the shot will serve to crack the coal at that point, and enable the charge of powder to break it down more readily and in larger quantity.

Attention has been drawn frequently, in *Coal Age*, to the fact that the explosion of the dynamite at the bottom of the hole is quite uncertain. It often happens that the explosion of the powder is not followed, as expected, by the explosion of the dynamite, which is found later in the coal thrown down by the shot. This is the chief source of the danger of using dynamite with a charge of powder. Dynamite should never be fired without a detonating cap.

It may chance that, owing to the quicker action of the dynamite charged with black powder, the explosion of the former may rupture the coal in such a manner as to cause a windy shot or "squealer." Or, the entire charge of black powder, or a large portion of it, may be thrown from the hole by the explosion of the dynamite and exploded in the air and cause disaster.

As stated in the inquiry, this practice of miners has been employed in numberless cases with good success; but it requires the best judgment on the part of the miner and, even then, there is no assurance that an accident will not happen. For this reason, the practice should be abandoned. The practice of mixing different grades of black powder in the same hole is also an exceedingly dangerous practice and should never be permitted.

## EXAMINATION QUESTIONS

### Illinois Mine Managers' Examination April 2, 1918

**Ques.**—When the air current in a mine contains marsh gas, which is the most dangerous, air saturated with water or unsaturated?

**Ans.**—When the air circulating in a mine generating gas is unsaturated it has a tendency to absorb the moisture from the roads and workings, which renders the mine dry and dusty and presents a more dangerous condition than would occur if the air current was maintained in a saturated condition.

**Ques.**—A seam of coal pitching at an angle of 16 deg. measures 6 ft., at right angles to the dip. What is the vertical thickness of the seam and the gross tons per acre, the specific gravity of the coal being 1.25? The cosine of 16 deg. equals 0.96126.

**Ans.**—The vertical thickness, in this case, is  $6 \div 0.96126 = 6.24$  ft. The cubic contents of this seam, per acre, is then  $43,560 \times 6.24 = 271,814$  cu.ft. The specific gravity of the coal being 1.25, the weight of coal, in gross tons, underlying one acre is

$$\frac{271,814 \times 62.5 \times 1.25}{2240} = 9480 \text{ gross tons}$$

**Ques.**—When a person comes in contact with a bare electric wire carrying 275 volts, which do you consider the most dangerous, alternating or direct current? Give reasons why.

**Ans.**—The question does not state, what is of the most importance, the amperage of the current; and it is difficult to state which, if either, of these two kinds of electricity would prove the most dangerous, with only 275 volts. It should be remembered that, with this low voltage, it is amperage, or the volume of current flowing, that is the determining factor in respect to the effect produced on the human system.

An electric current may prove fatal to life in either one of two ways: (1) by shock to the nervous system; or (2) by the heating effect produced by the resistance of the body and which burns the flesh and dries out the blood. The first contact of the body with a live wire carrying *direct current* produces a shock in proportion to the voltage of the current. The shock is immediately followed by the heating effect, which depends on the quantity of electricity flowing through the body, or the amperage of the current. On the other hand, if the wire is carrying alternating current, there is a rapid repetition of the shock due to the voltage, and this rapid succession of shocks increases the danger and may prove fatal if continued, even though the amperage be small. Replying, then, to the question asked, bearing the foregoing facts in mind, it may be said that a direct current of considerable amperage, even with this low voltage, might be considered as more dangerous than an alternating current of the same strength and pressure, although many will agree that there is not much choice between them.

**Ques.**—If a collar or crossbar, 8 in. in diameter and 8 ft. between supports, bears a certain load what should be the diameter of a collar or crossbar, 12 ft. between supports, to bear the same load?

**Ans.**—In mining practice, it is the roof pressure or load per running foot of beam that determines the required strength or diameter of the beam; and the words "the same load" may be taken as referring to the same *unit load* resting on the collar. In that case, the cube of the diameter of the beam will vary as the square of its length or distance between supports. In other words, for the same unit load, the cube of the diameter ratio is equal to the square of the length ratio. Hence, calling the required diameter of the 12-ft. beam  $x$ , we have

$$\left(\frac{x}{8}\right)^3 = \left(\frac{12}{8}\right)^2 = 1.5^2 = 2.25$$

$$x = 8 \sqrt[3]{2.25} = 10.48, \text{ say } 10\frac{1}{2} \text{ in.}$$

**Ques.**—State fully how powder and other explosives may be taken into a coal mine, and what precaution is necessary in handling powder and other explosives. State what is the maximum amount each miner is allowed, at any one time, and where same must be kept.

**Ans.**—The coal-mining laws of Illinois require that the powder must be taken in after the shotfirers have left the mine and before the entry of the dayshift for work. Explosives must not be carried in the same car with tools or other materials. The law provides that no workman shall have at any one time in the mine more than 35 lb. of black powder or more than 25 lb. of permissible explosives and not more than 3 lb. of other high explosives. All explosives must be kept in a wooden box, securely locked, which must be placed as far as practicable from the track and from other boxes in which powder is stored. Black powder and high explosives or caps must not be kept in the same box. Likewise, detonators must not be put in the same box with detonating explosives.

**Ques.**—In coal mines where heavy blasting is done, or in mines generating a large or small percentage of marsh gas and where fine dry coal dust has been allowed to accumulate on the roadways and timbers, sides or ribs, state fully what might take place if these conditions were allowed to exist. What mixture of marsh gas and coal dust will explode when ignited?

**Ans.**—Under the conditions named, a blownout shot caused by an overcharge of powder or a badly placed shot would be likely to cause a destructive mine explosion that would be propagated throughout the mine by the gas and dust accumulated on the roads and in the working places.

That coal dust lowers the explosive limit of firedamp is well known; but the percentage of gas and dust in the mixture cannot be stated, as this will vary with the inflammability of the coal, the amount and fineness of the dust and the character of the flame causing ignition.



# COAL AND COKE NEWS

## Harrisburg, Penn.

State Fuel Administrator William Potter has announced that he will turn over to the United States District Attorney evidence in the case against James Brothers, of Pottsville, Schuylkill County, accused of shipping to market four carloads of anthracite which contained from 14 to 47 per cent. slate. At a hearing held on May 22, Mr. Potter upheld an order of Baird Halberstadt, fuel administrator for Schuylkill County, who closed the company's colliery until June 1 and sent four cars of coal back to be unloaded and prepared for market.

The cars were en route to market and ordered back from St. Clair scales by Halberstadt. The state administration ruled that the cars should be hauled back to the colliery, unloaded, and before any coal can be loaded into the cars, the county administrator must certify that the cars were unloaded.

The state administrator also ruled that the Cambridge Colliery must be closed until June 1, and shall be allowed to operate after that date only provided changes have been made in the breaker and its machinery that will enable the operators to better prepare their coal. At resumption of operations, only coal that is freshly mined may be run through the breaker. Dumping of culm banks is prohibited. All shipments from the colliery will be inspected by representatives of the administration, and if found below standard, operations will again be suspended.

There was from 17 to 47 per cent. slate in the condemned cars. Some of the coal was consigned to the Home of Indigents. The gravity of this case has been aggravated by James Brothers, who on former occasions obtained permission to ship a car of condemned coal for use in a slate quarry owned by them. Instead of shipping the coal as they were given permission to, the operators sold the coal into the anthracite pool at Port Richmond, where it was mixed with high-quality anthracite.

Because of the repeated warnings given these operators, and the lack of defense on their part, it has been decided that the evidence in this case will be presented to the Federal District Attorney with recommendation for violation of the Lever act, and as a warning to other operators.

## Charleston, W. Va.

The apportionment of cars to the several West Virginia coal fields, including the Kanawha & Michigan district, the Kanawha district and the New River district, appears to be most satisfactory. The car supply in the New River district, for instance, reached about 90 per cent. this week, and operators confidently look forward to a better supply next week because most of the shipments from here were for tidewater, so that there ought not to be any undue delay in the return of such cars.

The production during the week ending May 18 was 137,862 tons and the total of hours worked was 3344. Total hours lost because of car shortage was 639, and because of labor shortage 339. Just 24 hours were lost because of a strike, while on the score of mine disability (and in that is included power shortage) 277 hours were lost. All other causes were responsible for 104 hours of lost time. Between May 1 and May 23, a total of 27,322 loads were shipped out. In the same period the empties received amounted to 26,624.

In the New River district the situation, insofar as cars are concerned, is regarded as being much improved, although it is not so good this week as it was last week. While the problem which now confronts the operators is almost entirely a transportation problem, should there continue to be an improvement in the car supply so that mines would be able to produce to their capacity, the problem will be entirely a labor problem.

Coal operators believe that the amendment proposed by Provost Marshal General Crowder under which men in practically all occupations will have to work or fight is going to have a wholesome effect in the mining industry, where many miners are

indifferent to whether they work full time or not. One suggestion which has been made is that concrete plans be adopted by all operators to check men in and out.

The car supply fell short of what it has been during the last month in the Fairmont district, the supply in the Fairmont field fluctuating between 700 and 900 cars.

Returning from the Villa mine of the Mill Creek Canal Coal Co., where 13 lives were lost as the result of an explosion of a gasoline engine which furnished power for a fan within the mine, W. J. Heatherman, Chief of the Department of Mines, after pointing out that the mine had not been inspected since April, 1917, issued a statement saying that he would close every mine in the state which did not remove any fans which were operated within the mine. In his statement the new mine chief said: "The records of this department show that this mine had not been examined since Apr. 25, 1917, and was classed in first-class condition, when the facts are that it was found to be in a deplorable condition. Not only the department of mines, but the owners and officials of the mine have shown the greatest disdain for human life and property, or they would not have allowed a gas-driven fan to remain over 400 ft. within the mine when it should have been installed on the outside. Since this occurrence this department has been advised that a great many mines throughout this district have fans inside the mines. This is to advise that any fan found within the mines in the future, whether gas-driven or otherwise, must be removed at once."

## Birmingham, Ala.

In the Birmingham mining district conditions show little improvement. The local output is still under what many think it should be. Labor is being urged to greater activity and mine employees, both whites and negroes, at ore and coal mine, are being asked to give their best effort to steady production, as an increased output of ore and coal is needed to keep up the production in war industries and to meet the ordinary demands of the public.

The ore and coal miners are also being urged to give their work closer and better attention in an effort to produce the cleanest coal and ore possible, as carelessness in mining and dirty product has proved most costly to the Government thus far.

Coal production is scarcely above the steady demand, and while Federal fuel administrators are advising that some coal be stored for use in the fall and winter, so far little has been accomplished.

There is no complaint to be heard of the railroad car service in the mining district. The only dissatisfaction arising during the week has been because of unsteadiness and inefficiency of the labor.

## Victoria, B. C.

The use of powdered coal to replace fuel oil is the subject of experiment in British Columbia. In Vancouver City the B. C. Sugar Refining Co., one of the largest of the Provincial industries, has installed a plant to provide for the change and, it is understood, is getting satisfactory results. The Canadian Collieries (Dunsmuir) Ltd., anticipating a demand for the new fuel, is making tests of waste from its washery which has been accumulating for years in the harbor at Ladysmith, B. C. If the results prove what is expected, the company will install special equipment for pulverizing and will proceed with the reclaiming of this coal refuse, of which there must be four or five million tons and some of which has been lying under water for 17 years. It is considered probable that, should the experiments now under way turn out right, and providing the United States withdraws the "tankers" at present in service between California and British Columbia, the Canadian Pacific Railway Co. will arrange for the use of coal dust in locomotives now burning oil.

An interesting sidelight on the increased value of coal in the Canadian Northwest is obtained from an experience of the

Pacific Coast Coal Mines Co. In prewar days the company discharged its waste into a lagoon, across which a rough cofferdam had been constructed. George Wilkinson, then manager of the company's operations, and now Inspector of Mines for British Columbia, was responsible for this. His idea was that this coal, for which there then was no market, might prove useful in an emergency. Last year some 50,000 tons of it were recovered and sold at \$3 a ton.

A new company, known as the Canadian Western Fuel Co., has been incorporated in British Columbia for the purpose of purchasing, taking over and operating all the assets in British Columbia of the old Western Fuel Co., of San Francisco, Cal. The incorporators of the new company are G. W. Bowen, J. B. Bowen and John Hunt, and the capital is \$5,000,000. There will be no change in the management of the company as at present constituted, and its headquarters will be at Nanaimo, B. C. G. W. Bowen is the general manager and John Hunt remains the general superintendent. J. B. Bowen is the manager of the Western Mercantile Co., the trading establishment opened by the Western Fuel Co. when it was reorganized a year ago.

The Granby Consolidated Mining and Smelting Corporation, in the course of developing its newly acquired coal bearing areas near Nanaimo, B. C., has driven three slopes. On one, at a depth of 150 ft., a seam, 14 ft. at that point, has been opened up. The management express themselves as satisfied with the results up to date.

The purchase of the Vancouver Island properties of the Nanoose Collieries, Ltd., by the Nanoose Wellington Coal Co. has been announced. Lewis Williams, president of the purchasing company, has given a statement to the effect that it is the intention to push the development of the coal-bearing areas controlled by the new concern to the end that the present output may be trebled.

## PENNSYLVANIA

### Anthracite

**Wilkes-Barre**—Only \$1 damages was awarded by a jury on May 25, in the suit of Mrs. Elizabeth Alexander against John Conlon, an independent operator of Plains township. Mrs. Alexander was unable to prove to the Court's satisfaction that damages to her property were caused by the Conlon operations.

**Pottsville**—The ruling of Provost General Crowder on the draft question may affect all strikes after July, declare labor leaders, who say that such a strike as is now being conducted at the Philadelphia & Reading Coal and Iron Co. shops may be banned by the order. These men, many of them of draft age, have been idle a week, demanding a 30 per cent. increase of wages.

**Hazleton**—Anthracite operators in the Lehigh field expect a record output for May. Thus far there has not been one day of idleness outside of Sunday, and the supply of cars has been better than at any time within the last two years. Despite the unfavorable attitude of workers, companies still hope the men will meet their request to continue at their places on Memorial Day.

The departure of 120 boys from here and 89 from Freeland, in the draft quota on May 27, has made such inroads on the operating forces of the coal companies that an appeal will be made to the district exemption board at Scranton at once to place all miners in deferred classification. It is contended that miners are as necessary at the collieries for the successful prosecution of the war as they may be at the front.

### Bituminous

**Stroudsburg**—The Lackawanna R.R. is storing 2000 cars of bituminous coal at the Gravel Place, East Stroudsburg, for use in case of a coal shortage in the next year. The coal will be left there until needed by the company.

**Uniontown**—Coal land in Fayette County reached a record price recently, when the Jamison Coal and Coke Co. purchased 550 acres of coal land from the Alfred Fuller estate for \$1,760,000, which is \$3200 an

acre. The tract is the last of the large undeveloped coal tracts in the county and is situated near the holdings of the Washington Coal and Coke Co., extending to Perryopolis.

#### WEST VIRGINIA

**Fairmont.**—John Y. Hite, who has extensive operations in this section, has consummated negotiations for the purchase of 27 tracts of coal land in Harrison and Marion Counties from the Whyel Coal Co., of Uniontown, Penn., the consideration being \$585,000.

**Williamson.**—Coal is again being shipped from what is known as the old W. J. mine, near here, by Harry Randolph, who recently acquired the mine.

The tippie of the Bailey Coal Co. on Pond Creek, near here, destroyed in the February flood, just as it was being completed, has been rebuilt, and coal is again being shipped. The superintendent and general manager is Capt. E. L. Bailey.

New machinery is being installed and new houses being built by the Wilhelmina Mining Co., near here. The superintendent of the company is Jack Goodloe.

**Junior.**—According to figures furnished by an officer of the Gage Coal and Coke Co., which operates near here, that company will expend \$150,000 on improvements to be made to its plant. This company owns 640 acres of Kittanning coal and improvements will be begun immediately. It is proposed by the company to transport part of the output of the mines across the Tygart's Valley River to be converted into coke. The improvements to be made will consist largely of electrical equipment. The estimated capacity of new work in tons per year is 800, and the estimated capacity of plant when completed in tons per year is from 150,000 to 175,000.

**Welch.**—The Standard Pocahontas Collieries Co., at Caples, McDowell County, has appropriated \$20,000 for improvement in its mining facilities.

In round numbers \$100,000 is being spent for improvements at the Ocean mine of the Marine Pocahontas Collieries Co., near Roderfield, the company only recently having completed a track to the mine.

A new bucket and cable system has supplanted the bridge formerly used by the New Pocahontas Colliery Co., at Hemphill, the bridge having been destroyed several months ago in a flood. A new stone store-room and office is being built by the same company at its Deegan plant.

**Jessop.**—Fire of unknown origin completely destroyed the power house of the Saxon Coal Co. last Saturday. Many tools belonging to employees were destroyed.

**Roderfield.**—A modern plant is being constructed by the Hampton Roads Mining Co. at this place. The Hampton company is a subsidiary of the Pocahontas Collieries Co.

**Charleston.**—Additional equipment is being installed by the Valco Coal Co., at Greenview, W. Va.

Preparations are being made by the Davis Creek Coal and Land Co. to sink a slope to the Coalburg seam. R. N. Snyder is general manager, with headquarters at Charleston.

**Morgantown.**—The Monongahela R. R. has applied to the Government for permission to expend \$225,000 in the construction of a railroad along Scott's Run, paralleling the Morgantown and Wheeling R. R., the company setting forth that the purpose in desiring to build up Scott's Run is to accommodate the Osage Coal Co. and the Cleveland and Morgantown Co. The Morgantown and Wheeling Railroad Co. has entered a protest against permission being granted for the Monongahela extension.

**Bluefield.**—One of the largest deals that have been made in the transfer of coal properties in the Pocahontas field of south West Virginia was completed on May 15, when Frank S. Easley, of Bluefield, acting as trustee of parties of Bluefield, Lynchburg, Va., and Welch, W. Va., purchased through L. A. Osborn, mining and construction engineer of Welch, all the holdings of the Bradshaw Pocahontas Coal Co. Several tracts of land that the Bradshaw company was operating under lease were purchased in fee. The new company will have approximately 1500 acres of the Bradshaw Pocahontas seam of coal, which will average 60 in. clean coal. The present equipment will be immediately enlarged for a capacity of 1000 tons daily.

#### ALABAMA

**Birmingham.**—The Woodward Iron Co. will begin at once the construction of a large Link-Belt concrete coal washery at its Woodward Furnace plant, which it is

understood will cost in the neighborhood of \$200,000. Construction work of every character in this district is being seriously retarded both by the shortage of skilled and unskilled labor and the inability to secure material and equipment without long delay.

It is announced that the Central Alabama Coal and Iron Co. will rehabilitate Jenifer furnace, located at Jenifer, in the western part of Jefferson County. Extensive improvements will be made in the machinery and equipment, including the installation of electrical power apparatus, the building of an ore washery and the addition of fifty coke ovens to the present battery of 100 ovens. Coal will be obtained from the company operation at Weller.

#### INDIANA

**Petersburg.**—Every coal mine along the Evansville & Indianapolis R.R. has resumed operation after an idleness of eight weeks. The shutdown was caused by a dispute over freight rates which has been settled by the Federal Government. Reopening of the mines means an increase of about 25,000 tons of coal a week in Indiana. The various shafts employ about 1000 men. Cars are being supplied now by the railroad company in satisfactory allotment.

New mines are being opened by the Atlas Co., north of Petersburg. Seven machines will be used in taking out the coal and approximately 350 men will be employed in the work. The Petersburg Business Men's Association has been asked to build 50 houses to accommodate the increase in workmen. Hundreds of miners who left Petersburg and vicinity when the mines closed are returning.

**Terre Haute.**—Vincenzo Boaso, president, and Lee Poll, secretary, of United Mine Workers Union of America, Local No. 6044, at Blanford, Ind., have reported that the union has adopted resolutions, in the form of a memorial, to be placed before the Indiana Supreme Court in the form of an appeal. The miners are requesting the right to be allowed to keep beer in their homes for family use, claiming that they do not care for saloons or whisky, but feel that they should be entitled to secure beer for home use and show that they are violently opposed to state-wide prohibition as now effective if it interferes with home consumption of beer.

#### OHIO

**Oreton.**—Three thousand acres of coal, clay and oil land, located at Oreton, Vinton County, have been purchased by Chicago men. Two of the interested parties are L. D. Binyon and J. A. Hogan, well known in Columbus, and the present operators of the Union Furnace Brick Co., at Union Furnace, Ohio. Mr. Binyon and Mr. Hogan were in Columbus last week consummating the deal and arranging for the development of the property. Immediate steps will probably be taken to open coal mines, and later developments will undoubtedly include the production of firebrick, oil and gas.

**San Toy.**—During the first half of May, Edward Blagg, at the No. 1 mine of the Buckeye Coal and Railway Co., loaded 258 tons of machine-mined entry coal in 12 working days. The entry is 15 ft. wide and the coal 3 ft. 8 in. high. On May 10 Blagg loaded 31 tons of coal in eight hours. His total credit for the two-weeks' pay was \$188.57. The coal was cut by a Sullivan C. E. 7 shortwall machine and gathered by a Goodman, articulated-type storage-battery locomotive.

#### ILLINOIS

**Nokomis.**—After a five days' fight with fire which broke out Saturday night, May 18, in the Peabody No. 2 North mine here, announcement was made by the mine officials on Thursday, May 23, that the flames were under control and that it would not be necessary as had been feared, to seal the mine. Damage estimated at \$75,000 to \$100,000 has been done, however, and it will be at least three months and probably six months before resumption at full capacity will be possible. Fire has been smoldering in the mine for seven years, behind concrete walls. Seepage is thought to have affected the sulphur deposits, causing the flames to burst through. The large machine shop and power plant below the surface were destroyed. More than a hundred men were employed at \$1 an hour to fight the fire. On account of the gas and smoke they could only work 10 min. at a time, with rest intervals of 15 min. The method was to put streams of water into the mine with all the hose that could be obtained. The mine employs about 800 men. Its output is about 2000 tons a week.

#### KENTUCKY

**Lexington.**—A big deal has been put over whereby the Elkhorn Coal Co. has increased its capital stock from \$100,000 to \$600,000, and absorbs the Detroit Elkhorn Coal Co., which has for some time owned and operated adjoining property. The stockholders of the two companies have taken up additional stock in the Elkhorn Coal Co., which in amending its charter broadened its scope considerably. The officers of the company are S. L. Bastin, of Lexington, president, and T. J. Cassidy, Lexington, secretary-treasurer. Most of the capital is held by Detroit and Lexington capitalists, several others being from the Hazard and Letcher County districts.

**Providence.**—U. B. McGraw, a baker of Providence, finding that there was little money in the bakery business under strict Government regulation, is opening a coal mine in the White Oak district, on the Illinois Central R.R., about five miles from town. The coal is of the No. 9 variety.

**Louisville.**—According to recent newspaper announcements from the Whitesburg, Ky., district, the Kentucky River Headquarters' Coal Co. is planning to develop several hundred acres of coal land along the headwaters of the Kentucky River in Letcher County. The property is alleged to have been purchased some time ago at a cost of about \$100,000. Several Louisville people, including K. U. McGuire, are said to be interested in the development. Mr. McGuire is in North Carolina and the report could not be verified.

**Paintsville.**—The business of the bankrupt Jennis Creek Coal Co. has been sold by Attorney H. S. Howard to a new organization composed of H. S. Howes, R. A. Patrick, James A. Williams and James W. Turner.

### Foreign News

**Sydney, N. S.**—The construction of the 120 new Koppers byproduct coke ovens at the plant of the Dominion Iron and Steel Co., with complete apparatus to recover the gas, tar, ammonium sulphate and other byproducts, is nearing completion, and the early starting of the first 60 ovens is now hoped for. This installation represents the latest word in byproduct coke-oven design, and will produce more coke with a smaller labor supply.

### Personals

**J. W. Massing** has been made superintendent of the Long Branch Coal Co., in operation at Long Branch, W. Va.

**Ben English**, who has been mine foreman for the Booth-Bowen Coal Co., Simmonds, W. Va., has resigned and will engage with the S. J. Patterson Pocahontas Co. in the same capacity.

**J. H. Hillman, Jr.**, of Pittsburgh, Penn., president of the Hecla Coal and Coke Co., and a director of the United Coal Corporation, has been elected a director of the Peoples Saving Trust Co. of Pittsburgh.

**John Crooks**, of Hazleton, Penn., has been named manager of the Pardee Brothers coal-mining interests to succeed the late Calvin Pardee. Mr. Crooks had been employed as superintendent of the collieries.

**Earl Henry**, who was chief mine inspector for West Virginia for 16 years, has been appointed superintendent of the West Virginia Rail and River Coal Co., of Columbus, Ohio, with headquarters at Hallwood, W. Va. He succeeds **Joseph West**, who has taken a similar position with the Rive Mining Co., of Dayton.

**E. W. Blower**, of Columbus, Ohio, secretary of the Hisylvania Coal Co., the D. C. Thomas Coal Co., the Piney Fork Coal Co., and the Pan Handle Collieries Co., announces that he will join the colors within a short time. He will retain his title in the four companies. During his absence his work will be looked after by **John L. Jones**, who has been appointed auditor, and **Elmer E. Leared**, who has been named sales manager and purchasing agent.

### Obituary

**Col. W. H. Mable**, who founded the town of Mable, about seven miles from Elkins, W. Va., about 20 years ago, and who has since that time been extensively engaged in the lumber and coal mining business, died recently while on a visit to his old home at Tideoute, Penn. He was 73 years old.



**John Morgan Lewis**, who for a number of years has been a resident of Jeanesville, Penn., died suddenly in that town on May 21, a victim of heart disease. The deceased was 65 years of age, and was a graduate of Lafayette college in 1875. Afterward he was employed as a mine foreman for the Pennsylvania Coal Co. at No. 10 colliery. Then he stood the examination for state mine inspector to fill a vacancy in the Hazleton district, holding the position for five years. Later he was mining engineer for Cox Bros. & Co., and then was associated with a number of smaller mining operations as operator. He is survived by his widow and two children.

### Recent Coal and Coke Patents

**Boiler.** P. Crosti, Milan, Italy, 1,250,979. Dec. 25, 1917. Filed Apr. 5, 1915. Serial No. 19,356.

**Coal Drill.** D. S. Bachelder, Tilden, Ill., 1,251,323. Dec. 25, 1917. Filed Apr. 19, 1916. Serial No. 92,191.

**Dump Car.** A. M. Gow, Duluth, Minn., 1,251,770. Jan. 1, 1918. Filed July 26, 1916. Serial No. 111,332.

**Safety Crosshead for Mine Hoists.** S. Jewell, Negaunee, Mich., 1,252,122. Jan. 1, 1918. Filed Jan. 25, 1915. Serial No. 4196.

**Means for Promoting Combustion of Fuel.** G. P. Ward, Chicago, Ill., 1,251,146. Dec. 25, 1917. Filed Oct. 16, 1916. Serial No. 125,782.

**Gas Producer.** E. A. W. Jefferies, assignor to Morgan Construction Co., Worcester, Mass., 1,251,038. Dec. 25, 1917. Filed Aug. 2, 1913. Serial No. 782,561.

**Gas Producer.** C. W. Lummis and G. H. Isley, assignors to Morgan Construction Co., Worcester, Mass., 1,251,064. Dec. 25, 1917. Filed May 21, 1914. Serial No. 840,110.

**Apparatus for Handling Coal.** R. M. Bickley, assignor to Heyl & Patterson, Inc., Pittsburgh, Penn., 1,251,626. Jan. 1, 1918. Filed Mar. 13, 1915. Serial No. 14,156.

**Process for Producing Liquid or Soluble Organic Combinations from Hard Coal.** F. Bergius and J. Billwiler, Hanover, Ger., 1,251,954. Jan. 1, 1918. Filed Aug. 3, 1914. Serial No. 854,825.

### Industrial News

**Molus, Ky.**—The Harlan Block Coal Co. has filed notice of an increase in its capital from \$35,000 to \$50,000, to provide for expansion.

**Hazard, Ky.**—The Kentucky River Coal Mining Co. has filed notice of an increase in its capital from \$100,000 to \$150,000, to provide for expansion.

**Artemus, Ky.**—M. T. Lindsay, president of the W. L. Blue Gem Coal Co., following action of the Board of Directors on Apr. 29, has filed notice of dissolution of the corporation.

**Birmingham, Ala.**—The Alabama Fuel and Iron Co. has recently acquired about 1725 acres of coal lands in the Harlan district of Harlan County, Ky., and is planning for immediate development.

**Pikeville, Ky.**—The Kentucky Elkhorn Byproduct Coal Co. is a new company which is starting operations at Shelby. H. L. Cox, one of the most prominent business men in eastern Kentucky, is superintendent of the new company.

**Harriman, Tenn.**—The Big Bend Coal Co. is planning for the immediate installation of machinery for the development of 500 acres of coal lands, to have a daily capacity of about 150 tons. L. O. Scott is president; Arthur W. Evans is manager.

**Dora, Ala.**—The May & Phillips Coal Co., recently incorporated, has perfected organization, and is planning for the immediate development of about 40 acres of coal lands, to have a capacity of about one car daily. John D. Phillips is president.

**Kingwood, W. Va.**—The Hoffman Coal Mining Co., recently incorporated with a capital of \$30,000, is planning for the immediate installation of the necessary machinery for the development of about 200 acres to have an output of 300 tons daily.

**Louisville, Ky.**—The Byrne & Speed Coal Co. and the Jellico Laurel Coal Agency have filed suit against the city of Louisville for approximately \$2000, representing coal purchased in October and November last, and upon which payment has not been made.

**Norton, Va.**—The Mohawk Coal Mining Co., recently incorporated with a capital of

\$50,000, is planning for the immediate development of about 1000 acres of coal lands near Keokee, to have a capacity of about 150 tons daily. H. P. May, of Norton, is president.

**Pikeville, Ky.**—The Middle Ridge Coal Co. is a new corporation that is being organized with Millard Burke as president; A. J. Younce, vice president and G. H. Francisco, secretary-treasurer. The main office will be at Pikeville, with mines at Elkhorn City.

**Jenifer, Ala.**—The Central Alabama Coal and Iron Co. is planning for extensive additions and improvements at its plant, including the construction of 50 new coke ovens at its coal mine in addition to the present battery of 100, the erection of a new washer at the brown-ore mines, etc.

**Seranton, Penn.**—The Delaware, Lackawanna & Western Coal Co. has taken bids for the construction of a large new coal breaker, about 140 x 140 ft. steel and concrete, to be located in the Providence section of Seranton. The structure is estimated to cost in the neighborhood of \$250,000.

**Wilhurst, Ky.**—The Wilhurst Coal Co., recently incorporated with a capital of \$20,000, has perfected its organization plans, and will commence work at once on the development of about 217 acres of coal lands to have a capacity of about two cars per day. J. C. Hurst is president; Ray Williams is vice president.

**Belleville, Ill.**—E. A. Daley, secretary of the Belleville Fuel Administration, has announced that the price of coal here will be advanced July 1 from 14c. to 15c. a bushel. The announcement followed a conference with the team owners' organization in reference to a demand for an increase from 75c. to \$1 in the hauling rate, which has been approved by State Fuel Administrator Williams, to go into effect at once. The team men were persuaded to wait until July 1.

**Richlands, Va.**—The Richlands Coal Corporation, which recently filed notice of an increase in its capital from \$50,000 to \$300,000 is planning for the immediate development of extensive coal tracts acquired in Tazewell County, on the Big Creek branch of the Norfolk & Western Ry. The company will commence work at once on the construction of a new railroad siding to the property, the coal to be loaded with a tippie from a tramway. It is planned to have a capacity of about 600 tons daily.

**Toledo, Ohio.**—Activity prevails in the lake trade at the port of Toledo. This is shown by the records of loadings at the docks of the railroads. During the week ending May 25 the Hocking Valley docks loaded 125,000 tons as compared with 117,000 tons the previous week. The total loaded since the opening of the season is 493,000 tons. During the same week the Toledo & Ohio Central docks loaded 68,000 tons as compared with 64,000 tons the previous week. The total handled since the opening of the season is 266,000 tons.

**Topeka, Kan.**—The Kansas Retail Coal Dealers' Association was organized at Topeka, May 15, when 145 retailers of the state attended the meeting called by the Topeka dealers' association. T. J. Monahan, of Topeka, was elected president; A. W. Rich, Emporia, secretary and treasurer. The executive committee, consisting of two coal dealers from each congressional district, will promulgate recommendations, including those to the Federal Fuel Administration. The zone system as it operates was criticized by many speakers at the convention.

**Fairmont, W. Va.**—The car supply was fair for the week ending May 25 and starts off fairly good this week. The regional car shortage was 7800 on May 14, but the fair supply last week has reduced that slightly. The railroads are in good shape locally, according to H. Wilson, superintendent Monongah division of the Baltimore & Ohio, who reports that all loads were cleaned up by the start of this week. The Shippensburg gateway is in fair shape. There is an insistent demand for coal from this district for the lakes, but the Fuel Administration is trying to send it east.

**Columbus, Ohio.**—Columbus domestic consumers will require more than 600,000 tons of coal for the year ending Apr. 1, 1919, according to figures submitted to the State Fuel Administration by James G. Young, secretary of the Franklin County Fuel Committee. This requirement is in addition to deliveries already made. Following a survey of the entire county, Young figured that for the year beginning Apr. 1 the county will need for domestic consumption alone 757,500 tons of coal. Of that amount 695,000 tons were figured as the need of Columbus domestic consumers.

**Amarillo, Tex.**—The Retail Coal Dealers' Association of Texas met in annual conven-

tion here on May 21 and 22, with dealers from all parts of the state in attendance. Cooperation with the Federal Fuel Administration in its campaign to induce industries and individuals to lay in their winter supply of coal during the summer months, while business is slack and transportation facilities can be had, was discussed at length and hearty indorsement given to all efforts of the Government along this line. Reports of dealers indicated that in all parts of the state the individual coal users are laying in their winter supply, and that the situation in this regard is most encouraging.

**Bluefield, W. Va.**—With only two out of the total membership of the association absent, the Pocahontas Coal Operators Association held one of the most successful meetings in its history in this city last week. Numerous matters of importance to the association were discussed, but definite action on a number of questions was deferred until a later meeting. George Wolfe and others who have given some thought to the subject presented to the association their ideas as to how the miners might be induced to work during the full time available. Mr. Wolfe has evolved some theories which he has been testing with excellent results, it is said, at his Winding Gulf operations.

**Columbus, Ohio.**—The completion of the double-tracking of the Hocking Valley Ry. from Columbus to Toledo will be pushed as rapidly as possible with the money supplied by Federal Director of Railroads McAdoo. This is the announcement of M. J. Caples, vice president of the Hocking Valley Ry., who returned from Washington last week. He said that of the \$25,000,000 allotted the Chesapeake & Ohio system, the Hocking Valley will get \$5,600,000, a large part of which will be used in the double-tracking project. The work has been going on for some time, but scarcity of labor and money have held it up. Speeding up will start at once. The Federal Government realizes the importance of the Hocking Valley Ry. in moving coal from Ohio, West Virginia and Kentucky to the lower lake ports for shipment to the Northwest.

**St. Louis, Mo.**—The hearing on the application of the St. Louis Chamber of Commerce to the Interstate Commerce Commission for the abolition of the bridge arbitrary of 20c. per ton on coal, is to be held Monday, June 3, at the Jefferson Hotel. Joseph W. Folk, General Counsel of the Chamber of Commerce, has resigned to enter the race for United States Senator, but will make the argument in the arbitrary case. City Counsellor Daues will file an intervening petition, to make the city a party to the petition. The East St. Louis Chamber of Commerce has adopted a resolution declaring its intention to ask for an increase of the arbitrary unless St. Louis abandons its effort to have it removed. East St. Louis at present enjoys an advantage of 20c. a ton in the coal freight rate, although it is a part of the St. Louis industrial district.

**Charleston, W. Va.**—What is regarded as one of the most successful meetings of the New River Coal Operators' Association was held here last week when about 30 members of the association were in attendance. The meeting was for the most part devoted to a review of conditions in the coal industry. No fixed policy was discussed or proposed by the various members. The association went on record as favoring the continuance of the West Virginia Association, but as believing and urging that the association ought to be conducted on a business basis and that it should devote its attention to only those things which affected the coal industry as an industry. All the officers of the association were present. C. C. Beury, president of the association, presiding. The other officers are S. A. Scott, vice president; Ernest Chilson, Thomas Nichol, H. M. Bertolet and G. H. Caperton, members of the executive committee.

**New York, N. Y.**—The Coal, Ice and Wood Division for the Borough of Manhattan of the American Red Cross Second War Fund received contributions of over \$107,000 in the campaign just closed. Among the largest contributions were: Delaware, Lackawanna & Western Coal Co., \$35,000; Williams & Peters, \$10,000; John Markle, \$5000 in Liberty Bonds; Dickson & Eddy, \$5000; Pennsylvania Coal Co., \$7000; Peale, Peacock & Kerr, \$2500; Pennsylvania Coal and Coke Co., \$2000; Thorne, Neale & Co., \$1500; Whitney & Kemmerer, \$2000; Burns Bros., \$2500. R. H. Williams, of Williams & Peters, was chairman of the committee, and M. F. Burns, chairman of the Coal Division. James A. Hill was chairman of the Wholesale Bituminous Committee; John A. Whitely, chairman of the Wholesale Anthracite Committee; George Eltz, chairman of the Retail Committee, and Thomas F. Farrell, treasurer.

# MARKET DEPARTMENT

## Weekly Review

### Output Still Below Requirements—Distribution Plan for Anthracite and Bituminous—Mine Price Reduced—Freight Rates Increased—Coal Denied to Less Essential Industries

REDUCTION of bituminous coal during the first five days of the week ending May 18 exceeded the 12,000,000-ton rate. On Saturday, however, output fell considerably, bringing the total for the week down to 11,732,000 tons, which is slightly below what was produced during the preceding week. The estimated weekly production of bituminous coal needed to cover our 1918 requirements is 11,900,000 short tons. Basing calculations on this estimate, the total actual production of bituminous to May 18 is more than 25,000,000 short tons behind schedule. For the first time in many weeks no car shortage was reported from the Pocahontas and Connellsville districts. In other sections operators received cars to only 50 per cent. of capacity, while the Fairmont region reported 71 mines idle owing to lack of cars. Though the car situation evidences signs of improvement, it appears likely that the shortage of labor in the mining districts will tend to keep output below maximum. Anthracite shipments for the week ending May 18 totaled 40,011 cars, the best showing since Apr. 6 and an increase of 2244 cars over forwardings for the week ending May 11.

A distribution plan for the entire output of both anthracite and bituminous coal has been decided upon by the Fuel Administration. The entire available supply will be apportioned by geographical districts and states so that every section will receive the entire amount that can be devoted to its industries. The production of bituminous coal will likely fall considerably short of the necessary quantity, and no material increase in the output of anthracite can be expected during the present coal year. The distribution plan was pushed to completion in order that every section of the country might be informed as to its exact status in relation to the available supply of coal and attempt to adjust its needs accordingly.

The reduction of 10c. per ton in the mine price of bituminous coal, and the order that all consumers are to pay the same price for their coal settled the long-standing controversy between the Fuel and Railroad Administrations. The net result will hardly show any effect in the gross tonnage; however, it will undoubtedly cause a more even output from individual mines. The increase in freight rates on both an-

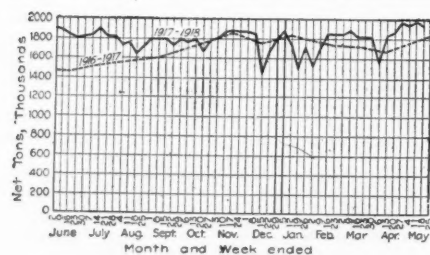
thracite and bituminous coal will raise the cost to the ultimate consumer from 15 to 50c. a ton, but he will not grumble at that if he can only get all the coal he needs.

The Fuel Administration continues to deny soft coal to less essential industries which have not procured priority certificates. Preferred consignees, on the other hand, have learned that the filing of a statement of their last year's source of supply does not mean that the coal will immediately be shipped to them from the same mines. This is the case only when such requisitions do not conflict with special uses for certain grades. Byproduct industries, bunkering needs, plants where low sulphur coals are essential, and even domestic requirements, it is understood, will be given preferential consideration.

On the eve of "Coal Week" anthracite demand for all sizes continues to pour in. Dealers cannot fill orders of all customers even up to two-thirds of their requirements. Steam business is active, with buying for current needs and storage purposes going on actively. Railroads are now taking a large tonnage.

#### COAL PRODUCTION

The slump in loading on Saturday, after a good five-day performance, caused production during the week ended May 18 to decline slightly. The total production of soft coal (including lignite and coal made into coke) during the week of the 18th is estimated at 11,732,000 net tons, an average daily production of 1,955,000 net tons, compared with 1,971,000 net tons during the week of May 11. Beehive coke production



during the week ended May 18 is estimated at 678,000 net tons, an increase over the preceding week of 10,000 net tons or 1.5 per cent. The average production per working day amounted to 113,000 net tons, compared with 111,000 during the week of May 11.

**Beehive Coke**—Production of beehive coke in the Connellsville and adjacent regions declined slightly during the week ended May 18. The principal operators located in the Connellsville, Greensburg and Latrobe districts reported production of 318,605 net tons, or 69.2 per cent. of their

maximum capacity, compared with 70.7 per cent. during the preceding week. The operators reporting had a hundred per cent. car supply during the past week and losses attributed to yard labor shortage declined from 19.4 per cent. during the week of May 11 to 14.4 per cent. Losses in potential capacity due to causes not reported, however, increased from 2.8 per cent. to 16.4 per cent. The same operators mined 129,950 net tons of coal.

**Byproduct Coke**—During the past ten weeks operating conditions in the byproduct industry have exhibited very little change. The ratio of production to maximum capacity rose from 87.5 per cent. in March to 89.6 per cent. on May 4, the maximum performance since the weekly statistics on byproduct coke were begun. Since that date the ratio declined to 89.2 per cent. the week ended May 11 and rose to 89.3 per cent. during the week of the 18th. Out of total losses of capacity of 10.7 per cent. during the week of May 18, 2.7 per cent.

#### CARLOADS OF COAL AND COKE ORIGINATING ON PRINCIPAL COAL-CARRYING ROADS

Week Ended  
Apr. 27 May 4 May 11 May 18

Bituminous shipments, 123 roads. 204,527 202,558 207,145\* 205,026†  
Anthracite shipments, 9 roads. 39,522 40,570 38,767\* 41,011†

\* Revised from last report. † Subject to revision.

Anthracite shipments were reported as 41,011 cars during the week of the 18th, an increase of the week previous of 2244 cars, or 6 per cent.

was due to lack of coal, 2.0 per cent. to labor trouble, 4.8 per cent. to repairs to plant, 0.3 per cent. to "no market" and 0.9 per cent. to all other causes. Material improvement, made possible by repaired plants, was reported by operators of New York State, the ratio of production to maximum capacity rising from 88.3 per cent. during the week ended May 11 to 93.7 per cent. Less favorable conditions, however, were reported by the operators of Alabama and West Virginia. In the former state the producing ratio declined from 91.1 per cent. to 88.3 per cent. and in latter state from 97 per cent. to 92.8 per cent., the decline in both states being due to repairs to plants. Minnesota alone continues to report loss of capacity due to "no market."

#### BUSINESS OPINIONS

**Dry Goods Economist**—The restrictions in imports recently put into effect by the Federal Government have further increased the shortage of merchandise. This condition is accentuated by the continued demands on domestic output for Government and Red Cross purposes, as a result of the expansion of our forces and their necessary adjuncts. An important development of the week was the sale of 5391 bales of German-owned cotton by the Federal Alien Property Custodian. More than 100 agents for cotton mills attended the auction and prices averaged close to 28c. a pound, while about 300 bales sold for 29½c. These prices, being considerably above the Exchange quotations, indicate that the cotton offered was above the Middling Uplands grade.

**American Wool and Cotton Reporter**—The uncertainties which have been noted in



the woolen goods market are still present, and while some believe that certain of the difficult problems will be settled in the comparatively near future, there are many who feel that they will not be settled at all, except over a period of time, and that no definite arrangement will be made for any of the unsatisfactory features now existing. It is becoming more apparent as each week passes that the amount of goods which will be available from any section of the producing industry will be relatively small for some time to come. Few feel that there will be any great shortage of raw material, but that the inability to operate all the machinery available, and other similar conditions, taken in combination with the large Government requirements, will practically eliminate the production of any large amount of civilian merchandise.

**Bradstreet's**—Tightening of conditions in nonessential lines, further speeding up of war work, excellent crop news, and reports that large distributors are selling all the goods they can get after Governmental requirements are satisfied, comprise the main-springs of the week's events. Because of a paucity of supplies at a time when shelves are being cleaned out of medium-priced goods, as the result of heavy buying flowing from abnormally high wages, linked, too, with concern about the likelihood of being unable to cover future requirements, final purveyors are buying liberally and as often as opportunity offers.

## Atlantic Seaboard

### BOSTON

**Tension relieved somewhat by settlement of railroad fuel question.** Policy of district representatives becoming better understood. Car service varies in different regions. Central Pennsylvania output near maximum on present car and labor supply. Only "preferred requirements" got shipments the past week. Many less essentials fail to grasp the situation. Hampton Roads dispatch excellent, but the great urgency is still for ships. Three large colliers now definitely assigned for railroad fuel. Coal for inland distribution not yet limited to preferred consumers. No "free" coal. Anthracite receipts improve on April figures, but still inadequate. Steam sizes in good request.

**Bituminous**—There has been so little favorable news of late that the President's action on the railroad fuel mix-up was received almost with acclaim, such hopes have been built upon an equitable distribution of cars. Undeniably the trade feels a slight easing up on the subject of contracts, particularly with operations in Pennsylvania, but it is hard to see how actual shipments can be materially increased in the aggregate. Whole groups of mines there are, especially where freight differentials have tended in normal times to discourage commercial buyers, that have had absolutely no cars for several weeks except for railroad fuel, and it is fair to suppose now that commercial business will now be undertaken, at least to a limited extent. A lot of such coal came forward a year ago on high prices and was readily absorbed by requirements that are now on the preferred list; but on the other hand the railroads will now be obliged to take fuel from operations that recently have furnished none. The net result will show hardly any effect on gross tonnage; it will probably mean only a more even output from individual mines.

The 10c. horizontal reduction causes no comment whatever, it being viewed as a solace to the railroads. Buyers here are not at all interested in price; they are ready to buy coal in any direction by rail or water. Operators can be thankful that their net margins are so little disturbed, for had the railroad interests prevailed there might well have been such a reduction on output as a whole as might seriously have diminished production.

The Fuel Administration continues ruthless in denying coal to "less essentials." Shipments by the train-load have been diverted from paper manufacturers, for instance, who are engaged exclusively on goods for the Government; but apparently there is no redress unless and until the consignees are definitely granted priority certificates. There begins to be an attitude of resignation toward these wholesale re-consignments, although now and then there is a cry, "How long?" So far there is no sign of any change in the instructions of May 15.

Taking last week as a whole, car-supply showed a slight improvement, but different districts showed such variation a general

statement is apt to be misleading. The territory tributary to the Baltimore & Ohio and the Western Maryland continues to suffer most, in some sections the shortage being in excess of 50 per cent. Open-top equipment is now withheld from all-rail service to New England on account of congestion due to shortage of locomotives. Box-cars with coal are allowed to come through, but the tonnage is necessarily so light that large industries looking to these districts for supply are beginning to despair. Similarly, the gas companies who depend upon the Pittsburgh region are much alarmed over the outlook there. Large consumers are being told their shipments are likely to diminish rapidly, since traffic conditions are so unfavorable to movement west. In the Fairmont district 71 mines were recently idle for lack of cars. The effect upon labor is serious.

In central Pennsylvania car-supply is not so far in arrears, taking into account the shortage of labor. The best opinion is that with the number of mine workers available and at what is now their average working time the whole district would be put to it to load 200 or 300 cars more a week, if they could be furnished. The average weekly output is a round million tons.

The smokeless regions in West Virginia continue to show the effect of "zoning" and the volume to the piers is fairly heavy. For what ships report the dispatch is excellent, steamers seldom being detained beyond the time necessary. The joint pooling arrangement is of great assistance, but the need of ships to speed up deliveries to this territory is still most urgent. A few of the lake-built steamers have now discharged their cargoes of Cape Breton coal and are arriving at Norfolk to begin regular service. Now and then a new ship like the "Tuckahoe" makes its appearance, but the number of bottoms is entirely too small to make up the arrears that stare us in the face. From Hampton Roads New England shipments since April 1, up to and including May 26, were 1,451,920 tons. When it is figured that 1,500,000 tons per month were estimated as necessary from Hampton Roads from April to October to give New England any reserve for cold weather he who runs may read what is in store for us.

Three steam colliers, the "Hampton," the "Transportation" and the "Coastwise" are now definitely in the coastwise service to carry fuel for New England railroads. Under favorable conditions these ships would together bring 800,000 tons a year, practically all of it from Baltimore piers. Thus far there has been no effort on the part of fuel authorities to restrict the distribution of water-borne coal to preferred consumers either inland or directly on tide-water. It seems only a matter of days, however, when distribution will again have to be rigidly supervised, now that large numbers of consumers are cut off from service all-rail.

Persistent inquiry from buyers still outside the breastworks fails to disclose any "free" coal. While existing "contracts" can hardly be considered binding, yet those factors who consider themselves morally committed and have regard for their reputation are increasingly shy of additional business. That will be their attitude at least until more transportation is in view. The tremendous demand for over-sea bottoms now that our troops are crossing in such numbers is an element in the situation that must be taken into account.

All-rail movement remains on about the same level that has prevailed since Apr. 1. The average for May up to and including the 24th was 479 cars of bituminous passing the five gateways. At this rate the 1917 figures will be materially cut. To maintain 10,000,000 tons per year the average would have to be 617 cars daily. It will be interesting to see the result in June in view of the decision in railroad fuel.

The railroads take different views with regard to paying purchasing agents commissions. There have been recent instances both ways, the desire to keep a safe margin, however, being a consideration in some cases where the commission was paid. One of the larger roads is making frequent drafts upon commercial coal arriving for distribution and another is picking up from limited storage, the usual practice being to take current supply directly from cars. Stocks therefore are materially less than a fortnight ago.

It has lately been announced that questions of railroad fuel will not be handled by state administrators, but should be taken up direct with Washington where a new office has been established for the purpose. New England engine supply is so mercurial it will be interesting to see how this plan works. It probably means more "emergencies," and therefore greater interference with well considered plans of distribution by representatives of the fuel administration on the ground.

**Anthracite**—At a recent conference in Philadelphia between fuel administrators of the New England states and members of the Anthracite Committee it was "agreed" that 1,250,000 net tons per month domestic sizes would be furnished this territory. During April the receipts are computed to have been 950,000 net tons and while May is going to show an increase the total will be nine hundred thousand tons below the mark set. Rail movement shows a falling off recently, but water shipments are holding up fairly well. The companies are adhering closely to the 1916 distribution thus far, although the program is sure to work hardship to a number of communities where through war industries the population has increased by leaps and bounds.

### NEW YORK

**Anthracite receipts far below requirements, with dumpings reduced.** Coal men watch efforts made to stock New England. Buckwheat coals in good demand with supply quickly absorbed. The bituminous situation active because of price reduction, settlement of railroad controversy and advance in freight rates. Dumpings for week show decrease.

**Anthracite**—Receipts continue to be far below requirements, as is evidenced by the reports of the number of cars dumped at the various local piers during the week ended May 27. These were 6205 cars as compared with 6346 cars in the previous week. Reports for the week ended May 18 show that 41,011 cars were shipped to market as compared with 38,767 cars the week ended May 11, an increase of 2244 cars, or 6 per cent.

Conditions are not favorable, and many complaints are heard of slow shipments. Few dealers can boast of much tonnage in their yards, while most of them lay claim to having at least enough orders on their books to keep their help busy for the next six months.

The order of the Anthracite Committee of the Fuel Administration of May 24 following a conference with the New England Fuel Administration that for the month of June a domestic tonnage amounting to one-twelfth of the shipments into New England during the coal year beginning Apr. 1, 1916, plus 50 per cent., shall be sent forward, caused some uneasiness here, the fear being expressed in some circles that this market is being slighted. It also resulted in new efforts being made to urge the appointment of a successor to Albert H. Wiggin, who resigned as State Fuel Administrator, several weeks ago.

Cyrus C. Miller, administrator of Bronx County, has notified Dr. Garfield that 1,451,250 tons of coal will be needed in that county during the coal year beginning Apr. 1, 1918.

The order of the Railroad Administration ordering increases in freight rates results in an advance of 30c. per net ton of 2000 lb. on coal; brought to this market. The trade was surprised at the largeness of the advance granted in view of the recent increase of 15c. per ton. The advance does not become effective until June 25.

The local situation is far from satisfactory. Consumers are anxious about their winter fuel and the dealers are powerless to help them. The larger sizes, egg, stove and chestnut, are in good demand, with pea a trifle easier.

The buckwheat sizes are in good demand. The larger of these coals is moving freely, buyers being numerous and anxious to pick up free tonnages. The better grades of rice and barley are hard to find, while most consumers are just as anxious to pick up the cheaper grades.

Bids opened last week by the Department of Docks and Ferries for 71,100 gross tons, two-thirds buckwheat No. 2 and one-third semi-bituminous, resulted in prices of \$7.39 and \$7.59 per ton, the latter price being made where it was provided there should be a reserve stock of several thousand tons on hand at all times.

Another city department had the following prices submitted in a bid: 6000 tons buckwheat No. 1, \$7.66 per ton; 12,000 tons buckwheat No. 2, \$7.10; 500 tons pea coal, \$8.06; 500 tons egg coal, \$9.44; 1500 tons broken, \$9.60; 4000 tons semi-bituminous, \$7.80; 250 tons nut, \$9.44, and 250 tons of stove, \$9.44.

Current quotations, per gross ton, f.o.b., tidewater, at the lower ports are as follows:

	Circular	Individual
Broken.....	\$6.55	\$7.30
Egg.....	6.05	6.80
Stove.....	6.30	7.05
Chestnut.....	6.40	7.15
Pea.....	4.90	5.65
Buck.....	4.45@5.15	4.80@5.50
Rice.....	3.90@4.10	3.80@4.50
Barley.....	3.40@3.65	3.00@4.00
Boiler.....	3.65@3.90	

The Labor League of New York City, at a meeting held in the City Hall on May 24, adopted resolutions "that we emphatically insist upon the coal dealers of this city being compelled to secure and store coal to meet the requirements of the people of this city next winter."

The resolution stated that the local dealers are apparently not doing everything necessary that could be done to prevent a recurrence of the conditions existing in this city last winter, and that "it is practicable and possible for the mines to be operated and arrangements made with the Government to transport coal during the summer months."

The resolutions also recommend that the dealers ascertain the actual amount of coal needed to fill the requirements of all the people of the city "in a long and cold winter similar to the extraordinary conditions which prevailed last year and in previous years," that the Mayor's Committee should then ascertain if the coal dealers have sufficient storage facilities for keeping the coal on hand, and if the dealers are willing and ready to secure the coal now and have it ready for delivery to their customers during the winter months. The resolutions also provide that after storage places are secured the matter of securing the coal be immediately taken up with the Federal authorities, so that the mines will be furnished with a sufficient number of cars for the carrying of coal to this city, and that "in the event that the mine owners are not willing to mine the coal and the coal dealers are not willing to store it, we demand that the city through the Mayor's Committee, purchase the coal and have it on hand for every emergency."

**Bituminous**—There was considerable activity in the situation last week although receipts were far below requirements. The reduction of 10c. per ton from the mine price, and the order by which all consumers shall pay the same for their coal, settled the long standing controversy between the Fuel and Railroad Administrations and eases the minds of many operators who have been waiting for some such ruling for many weeks. While the order results in a lower price for the producer, he is apparently satisfied because there is going to be an equitable distribution of cars which means steadier work and a larger output. On the other hand, some operators say that with labor short they will have difficulty in loading many more cars than formerly.

The increase in freight rates to become effective June 25 means an advance of 40c. per ton on New York tidewater shipments. Consumers are expected to take kindly to the new price they will have to pay for fuel.

Dumpings at the local docks for the week ended May 27 were 6295 cars as compared with 6625 cars the previous week, a decrease of 330 cars, while the shipments for the week ended May 18 were reported as 205,026 tons compared with 207,145 tons during the previous week, a decrease of 2119 tons.

The Tidewater Coal Exchange has eliminated five pools at this port, assigning Pool No. 15 to Pool No. 14; No. 22 to No. 9; No. 23 to No. 11; No. 24 to No. 18 and No. 47 to No. 18.

Stocks are low and free coals continue scarce. Bunker coals are in good demand.

#### PHILADELPHIA

**Anthracite deliveries unimproved.** Shippers can give no promises. New England being favored. Estimated needs far in excess of production. Non-dealer shipments increase. "Coal Week" idea ridiculed by dealers. City bureaus urged to buy at once. Buckwheat exemption order being obeyed now. Bituminous situation displays slight improvement. Car supply better. Some concerns stocking fair tonnage. Price reduction will not surprise. Some contracting, with new forms in use.

**Anthracite**—Shipments into this territory are not increasing, and as the season advances the dealers and their trade are becoming more anxious. The bulk of the coal that is being received is consigned to the regular buyers, who have always depended on the larger shippers for their supplies. During the season of 1916-17, which is now being used as a basis for all shipments, there were thousands of tons shipped to other than the old line of buyers. Each dealer who had a car shipped during that period seems to be able to trace it to its source and is claiming at least the same tonnage now, but those who bought spasmodically or in small lots have thus far received scant attention. Some shippers claim that it is this class that is becoming most insistent for coal. It is not that any shipper declines to fill such orders, but they take the stand that they do not have the coal now and will endeavor to cover this tonnage later in the season.

Much disappointment has been expressed by the local dealers, who had expected an excess of tonnage for May over their allotted proportion. They had laid great hopes on this eventuality, owing to the fact that several of the larger companies had shipped them quite liberally in April. During the last week of the month just past any number of local retailers failed to receive a shipment from the big companies. They were candidly advised that they had received their proportion for May and were not at all likely to receive any more coal during the month. As a consequence many of them had their equipment idle.

Recently retail shippers have been inclined to criticize the rapidly growing practice of fuel committees in outlying sections in granting permission to various individuals to receive carload shipments. It will be remembered that the national administration had decreed the elimination of this practice except with the approval of local authorities in each instance. Recently the committees have taken the stand that such shipments are permissible where the buyers had made similar purchases in 1916, but are compelling the shipments to be made in care of retail dealers, who thereby get the hauling. However, the claim has been made recently that even this restriction has not been deemed necessary, and that persons with some influence have been able to obtain shipments without the necessity of having the coal sent in care of a dealer.

The wisdom of designating the week of June 3 as "Coal Week," when the public is expected to file orders for the coming fall and winter, is being severely criticized or referred to as a joke by the retailers here. Certainly this part of the trade needs no artificial stimulation. There are many who have far oversold their quota, and certainly none who with slight effort could not do so.

This week the state and local fuel administrators urged the city officials to endeavor to purchase early a large proportion of the coal needed by the municipal institutions for next winter. Messrs. Potter and Lewis, chairmen of their respective committees, have asked the city's director of supplies to lessen the red tape surrounding contracts let by the city, in order to expedite deliveries of coal. At the same time the city authorities were urged to make payment for fuel promptly, as often payments are considerably in arrears. While in usual times shippers were inclined to overlook this condition, yet at this time there is a decided disinclination to ship to any one where payment is not forthcoming within a reasonable period.

As to the relative sizes among the dealers there still continues to be no favored size. The situation is simply one of eagerness to get coal of any size, and no yard in the city has a stock of any kind of coal on hand. The consuming public undoubtedly has a preference as to size, but there is no difficulty whatever in having the customer change the size on request from the dealer to conform to such shipments as he may have at the moment.

The latest development in the steam trade is the fact that the larger companies are now asking their customers using buckwheat coal to secure exemptions from Washington in accordance with the instructions issued by the anthracite distribution committee almost a month since.

The prices per gross ton f. o. b., cars for line shipments and f. o. b. Port Richmond for tide are as follows:

	Line Tide		Line Tide
Broken.....	\$4.90 \$6.05	Buckwheat.....	\$3.15 \$3.75
Egg.....	4.50 5.70	Rice.....	2.65 3.65
Stove.....	4.75 6.05	Boiler.....	2.45 3.55
Nut.....	4.85 6.10	Barley.....	2.15 2.40
Pea.....	3.45 4.35		

**Bituminous**—It continues to look as if there is a continued improvement in the car supply, with a consequent increase of tonnage shipped to the city recently. Aside from the utility plants we are now able to notice other industrial enterprises which are beginning to accumulate some stocks of fuel in excess of current consumption. This is far from a general condition, but the signs are at least encouraging. Operators state that the labor supply is far from satisfactory, and signs of unrest among the men cause many anxious moments to the shippers.

Recently some shippers have closed contract business with big consumers, especially with trade they have not heretofore served very heavily, but who are among the most necessary and vital consumers. The idea appears to be that this business must be taken care of in any event. Most shippers have now received the approval of the new contract forms, the principal change being an insertion of the Garfield order of Dec. 24, 1917, bearing on the contract business.

#### BALTIMORE

**Diversions of coal continue to make the bituminous situation here fairly easy, except on Pennsylvania line points. Hard coal men see big shortage ahead, and consumers are getting uneasy.**

**Bituminous**—Through diversions of coal at junction points to the west of here, fuel for the most part originally destined for the Storrow account in New England, this section continues to receive a fair supply of bituminous coal. As the coal arriving here on direct consignment is confined practically to the preferential delivery list and for Government account, such as shipping, a serious state of affairs would exist for the less essential industries were it not for the diversions named. The various Government committees at Cumberland and nearby points are working hard to prevent any freight jams at the junctions, and whenever there is any evidence of congestion blocking progress on the northern connections the coal is at once rerouted through to this section and to the Washington district before it reaches the Cumberland scales. This method has kept the Baltimore & Ohio and Western Maryland lines pretty well open on direct shipment, and meanwhile the shipments have benefited consumers here. There is still complaint, however, from those consumers on the Pennsylvania who were cut off under the zone plan and who for the most part have found it impossible to make any new supply connections on the Baltimore & Ohio and Western Maryland lines. The Fuel Administrator and his committee here have been called upon repeatedly and have managed to keep these concerns going for the most part, although there was one shutdown reported the past week.

**Anthracite**—The more the hard coal men here delve into the prospects for the coming fall and winter the more convinced they are that a big shortage will be faced here. The trade is now engaged in compiling figures to show the amount of tonnage distributed so far, the amount of coal in yards, the immense increase in ordered tonnage, etc. These are to be carried to Washington by the local fuel administrator to prove that unless there is a decided increase in deliveries here the trade will not only fail to deliver the two-thirds on orders before fall, but the winter will be faced by many without sufficient supplies to carry through. The trade here has joined in with the general request of coal men that the administration in Washington stop urging people to insist on immediate deliveries of coal that is not here to distribute. The trade does not object to placing orders on the books, but the consumers are not satisfied, in the face of Government urging, to await deliveries, and many warm arguments are taking place. The National Fuel Administration urging has undoubtedly placed the retail hard coal trade in an unfortunate position.

#### Lake Markets

##### PITTSBURGH

**Operators not enthusiastic about 10c. reduction. Car supplies better. A fair amount of stocking by consumers.**

Pittsburgh coal operators have not enthusiastically approved the reduction of 10c. a ton in bituminous coal prices which went into effect at the beginning of this week, not only as to new sales but also as to deliveries, no matter when the contract was made. A few operators assert that they have been making practically no money. At the same time it is generally recognized that the 10c. reduction represents a compromise, the Fuel Administration having proposed a 20c. reduction to equalize with the fact that the railroads are to pay the full set prices instead of the much lower prices proposed by the Railroad Administration.

The wording of the official statement, that there will be no further changes in coal prices until costs for the 12 months ending Aug. 31 have been studied, suggests that the Fuel Administration has no thought of making any advances in future but has hopes of finding a basis for reducing prices further. All the operators, of course, are making much better cost showings than in the winter.

Car supplies in the Pittsburgh district have undergone some further improvement and are now fairly satisfactory. There is some shortage of labor, this being more noticeable than when operations were so much curtailed by car shortage, and fears are entertained that men will not be so eager to work now that there is less idleness enforced by lack of cars. Operators feel



that the men should work longer hours per week than those prescribed in the scale as minimum.

More coal is being stocked by the large consumers than formerly, and all show a willingness to stock to the limit of their ability, a willingness that will now be enhanced by the 10c. reduction in price. The majority of observers, however, believe that the rate of stocking thus far has not become high enough to insure that consumers will be carried through next winter without difficulty.

A moderate amount of coal is being sold in the open market, and the proportion that passes through brokers, with an extra brokerage charge to consumers, is somewhat reduced. Many brokers, however, are having a fair turnover from week to week. With the 10c. reduction, effective at the beginning of this week, the set prices are as follows: Slack, \$2.10; mine-run, \$2.35; screened, \$2.60, per net ton at mine, Pittsburgh district, subject to 15c. brokerage in addition in the case of sales made by brokers.

#### TORONTO

**Supplies of anthracite coming forward freely. Dealers filling winter orders. Bituminous scarce. Fuel Administrator advises dealers to order all they can. Wood as substitute fuel.**

Supplies of anthracite are coming forward freely and the dealers are now filling winter orders, but owing to consumers having placed these earlier in the season than usual, there are large arrears to be overtaken. Shipments by water have so far been considerably smaller than during previous seasons. There is a marked shortage in the supply of bituminous, which is much in requisition. R. C. Harris, Fuel Administrator for Ontario, is advising dealers to place orders for all the coal they can, and expresses the opinion that owing to war conditions the supply will fall far short of meeting the requirements of consumers. He urges the municipalities to arrange for wood supplies in sufficient quantity to make good any deficiency.

Quotations for best grades per short ton are as follows: Retail anthracite egg, stove, nut and grate, \$10; pea, \$9; bituminous steam, \$8.50; slack, \$7.50; domestic lump, \$10; cannel \$13. Wholesale f. o. b. cars at destination, three-quarter lump, unprepared, \$6.11; prepared, \$6.31; slack, \$5.18.

#### BUFFALO

**Would be plenty of coal but for car shortage. Jobbers find it hard to keep going. Anthracite moving steadily by Lake. Local supply light.**

**Bituminous**—The change in the situation is mostly due to lack of cars. Nobody seems to have a supply, and some of the mines get none at all some days. An increased amount of bituminous is moved in box-cars and yet the shortage grows. If the scarcity gets much worse it will be impossible to meet the most ordinary demands. At the same time the anthracite movement is at least normal, but that trade is allowed to use box-cars freely. Some of the lake shipping docks here now have box-car unloaders, so that they can move coal as well that way as by dumping.

The new order reducing the prices of bituminous 10c. a ton is not well understood here yet. It will reduce the following quotations by that much, if regularly effective: Allegheny Valley thin-vein, \$4.45; Pittsburgh lump, \$4.25; Pittsburgh mine-run, \$4; Pittsburgh slack, \$3.75, all per net ton, f. o. b., Buffalo.

**Anthracite**—The movement is fairly large. An average amount by lake is now going out and it does not appear to affect the local supply seriously, which means that the leading companies have diverted the usual amount from the eastern trade and that the upper lakes will get their regular supply. The city consumers are not making such feverish demands for coal as they were before the early warm weather set in, and it may be that they will soon find that they are getting enough to warrant the expectation of a full supply in good time.

Canada does not appear likely to slacken her demand for coal. In spite of the big supply of bituminous there and the advice to lay in some of that for emergencies, the retailers and consumers still beset the shipping offices here about as they did during winter.

Shipments of anthracite by lake for the week were 104,300 tons, of which 41,300 tons cleared for Chicago, 34,400 tons for Duluth and Superior, 10,800 tons for Sheboygan, 7500 tons for Green Bay, 4500 tons for Milwaukee, 3300 tons for Marquette and 2500 tons for Hubbell. Freight rates are 60 and 65c. to Chicago, 50c. to Sheboygan and Green Bay, 48c. to Duluth and Marquette, 55c. to Milwaukee and 45c. to Hubbell.

#### DETROIT

**Diminishing receipts of bituminous and anthracite cause anxiety. Margin to retailers yet unchanged. Lake shipments not heavy.**

**Bituminous**—Jobbers find that while there is a comparatively free movement of bituminous coal into Detroit, the shipments are largely of mine-run, and that other sizes are coming in in small amount. Users of steam coal with plants adapted to consumption of mine-run are having little difficulty in providing for their requirements. Those who are accustomed to use slack, nut or pea sizes find it less easy to obtain the coal they desire. The demand from consumers of steam coal continues steady and is well maintained.

There is a noticeable deficiency, jobbers say, in the supply of domestic sizes of bituminous. Household consumers are not yet buying heavily, however, while the controversy between Detroit dealers and W. K. Prudden, Michigan fuel administrator, in reference to what constitutes a just margin of profit on domestic coal delivered during the summer, is apparently reflected in a curtailment of deliveries by the dealers. The state fuel commissioner has not yet made known his decision as to a recommendation submitted by the Detroit Board of Commerce asking that a margin of \$3 a ton be allowed on bituminous and \$2.50 a ton on anthracite. Meanwhile the margin of \$2.50 a ton, previously fixed by Mr. Prudden as applying to all domestic coal, remains in effect. Retailers insist their costs range from \$2.14 to \$2.45 a ton in handling domestic coal, and some of them assert they will go out of business if the margin of \$2.50 is maintained.

**Anthracite**—Incoming shipments of anthracite are not increasing. Records of the secretary of the Detroit and Toledo railroad committee show that the daily average receipts of anthracite since May 1 have been 36 cars, a large drop from the daily average of 56 cars in April. Points in Michigan outside Detroit also show a reduction in supply, the daily average for the state, outside Detroit, amounting to 51 cars this month against 58 during April. Many household consumers who have been endeavoring to provide their winter supply find dealers unable to deliver the coal and declining to book orders for future delivery.

**Lake Trade**—Shipments of coal by the lakes have considerably diminished since the opening of navigation. The supply arriving at loading docks is not sufficient even for loading ships under carrying contract. Many are going up without cargo.

#### COLUMBUS

**Continued good demand for steam and domestic grades is the chief feature of the Ohio trade. Lake trade is progressing satisfactorily.**

Under the influence of a better car supply, excepting on some eastern Ohio railroads, production in Ohio fields has been increased during the past week. In eastern Ohio there is still a shortage in cars and the output is consequently restricted. Demand is good for both domestic and steam grades and little is on the open market. On the whole the tone of the trade is good and prospects are for a continuation of the active conditions.

The lake trade is one of the most active departments of the industry. Every lake shipper is hurrying a large tonnage to the lower lake ports for shipment to the Northwest. The vessel movement is good and as a result there is also a good ore movement. Ice is now all out of the straits and upper passages and there is no interference of that nature. Lake prices are firm at former figures, and the recent reduction of 10c. on the ton will not affect lake coal as practically all has been contracted for at original quotations. Some delay in getting permits from the Ore and Coal Exchange has caused a slow movement in certain thin-vein regions. The lake pool officials are insisting that both thick and thin vein prices be the same.

Domestic trade is active and dealers are busy making deliveries. Retail stocks are not large and every effort is being made to increase them. Householders are buying liberally, even if they cannot get the customary grades. There is little Pocahontas coming into the Columbus market. Considerable West Virginia splint is arriving, however, to make up the deficiency of Pocahontas. The greatest part of the tonnage sold in the domestic trade comes from Hocking Valley and Pomeroy Bend mines. Retail prices so far have not been affected, but a general reduction of 10c. to correspond with the change in mine price is expected.

The steam business is active to the extreme. Buying both for current needs and for storage purposes is going on actively. The larger users have some sur-

plus stocks and are buying rather liberally. Smaller users are increasing their surplus where they have available storage space. Railroads are taking a large tonnage, especially from eastern Ohio mines.

Production is active in most districts as the car supply has been good. This is especially true of the Hocking Valley where the output is estimated at 90 per cent. of normal. In the Pomeroy field the percentage is about the same. In Cambridge and Crooksville production is estimated at 80 to 90 per cent. of normal. Eastern Ohio is still hampered with a shortage of cars and the output is about 65 per cent. of normal.

#### CINCINNATI

**Maximum activity continues in distribution of coal, and dealers' stocks are therefore not rising. Larger receipts would be welcome, but car supply limits shipments.**

Deliveries of coal against orders by consumers for storage are continuing at an unprecedented rate, and are limited only by the delivery facilities of dealers on the one hand and the amount of coal available on the other. Receipts are not all that could be desired, especially in view of the increasing volume of shipments to the Northwest, and indications are that unless the car supply increases so as to permit larger production and shipments, not much improvement in the local situation can be expected. However, the trade feels that much has been accomplished in securing orders for so large a proportion of next winter's local requirements, and that even if there should be a shortage next winter it will not in any case affect consumers as severely as they were affected last winter. The storage of coal by industrial consumers is as marked as that by domestic consumers, the accumulation of large quantities of fuel, which are piled in heaps outdoors, is going on at many manufacturing plants in and around Cincinnati. With the continuation of this movement during the entire summer, it is certain that consumers in all classes will start the fall and winter with more coal on hand than ever before.

#### LOUISVILLE

**Second draft is further reducing labor supply, resulting in greater difficulty in operating mines to capacity. Car supply fairly good. Demand for domestic coal good. Steam coal still little draggy.**

The greatest obstacle to satisfactory movement of coal during the past month has been the general shortage of labor, which has made it practically impossible for the large mines to operate at anything like capacity in spite of the fact that the demand is good and the car supply fair. Although coal prices have suffered some reductions since stocking up began, few complaints are being heard by the retailers concerning the fact that they paid more for next winter's coal than the present price.

The retail trade is receiving many inquiries for terms on coal stocked for next winter, buyers claiming that it is impossible for them to lay down the case or take care of the bill within 60 days. However, mines are paying off every two weeks, and expect prompt payment from the coal dealers, with the result that they are not in position to grant long terms on winter stocking.

In eastern Kentucky the labor situation is the worst factor, as a good supply of cars is being received. In western Kentucky the mines are operating nearer to capacity than for some time past, but are having more difficulty in obtaining cars than is the case in the eastern section of the state.

The numerous wagon mines which have been operating both in eastern and western Kentucky have been demoralizing labor to some extent. A great deal of good labor is working in these mines, where production cannot begin to compare to that of the large mines in comparison to the actual number of men employed. However, the high price of coal and the profits that are being derived from its sale has enabled hundreds of these little mines to operate, and take labor that would otherwise be producing much more coal in mechanically operated mines.

#### BIRMINGHAM

**Demand strong and steady in the local market. Storing of domestic coal is keeping a satisfactory pace with receipts, which are still much restricted. Distribution of steam-coal supply causes distributing agencies much worry and work. Output shows little betterment.**

Domestic consumers continue to evince much interest in acquiring their coal supply for another year, and the demand on dealers is unabated. Records of the Jefferson County Fuel Board show that 16,398

tons of coal passed into the bins of consumers during April, the first month of the coal year, which, in the face of the estimated local yearly requirements of 300,000 tons, might not be considered in an optimistic light but for the fact that in the past storing during the spring and summer months has been very light and the impetus given to the movement this year is gaining force and will likely only be impeded by two factors—financial inability on the part of the consumer and light receipts from the mines. Dealers have contracts and promises for approximately 100,000 net tons of the estimated requirements of 300,000 tons for year ending Mar. 31, 1919.

The distribution of steam coal, on account of the inadequate supply and priority regulations, is proving a vexatious problem, and many industries are unable to operate on a satisfactory basis due to lack of fuel, among which brickmakers are probably the most important. Contractors on the local Federal postoffice are understood to be facing a suspension of work because they cannot get the brick contracted for and which the manufacturers are unable to burn for lack of coal. The Southern Ry. priority order for the current week called for 51 per cent. of the output of operations on its lines in this district, being increased from 46 per cent. for the previous week.

Reports from producing districts are not optimistic as regards increased production. Mine workers continue to absent themselves from their work to an alarming extent, which is proving disastrous both to coal production and coke manufacture.

## Coke

### CONNELLSVILLE

Labor shortage more in evidence with car supply better. Blast furnaces almost completely supplied with coke.

The visible influence limiting coke production in the Connellsville region is shifting from car supply to labor supply. A number of operators report that on some days they have not sufficient labor to load all the cars furnished, but evidently this means that car supply has increased rather than that labor supply has decreased. Shipments on the whole are increasing slightly from week to week. There are no serious complaints by blast furnacemen of coke shortage, and nearly all the furnaces appear to be well supplied and to be getting out their maximum production of pig iron. There have been a few cases of furnaces asking operators to curtail shipments on contracts. There is a rather limited demand for coke in the open market and operators display some fear that free offerings in the open market would tend to depress prices below the set maximum. Doubtless such fears are well founded, for coke is a particularly difficult commodity to sell when there is not an active demand. While the Connellsville producers may be able to regulate the supply to requirements for the time being, there is a question what will occur when various byproduct plants are put in operation in the next few months. Including the Cleveland plant of the Steel Corporation, which began operations in part three weeks ago, the new byproduct capacity to come in by the end of September promises to represent about 100,000 tons of coke a week. While this will be chiefly by the Steel Corporation, which will merely curtail its production of beehive coke, it will represent the release of some men as well as of some railroad facilities.

The market remains quotable at the set limits: Furnace, \$6; foundry, 72-hour selected, \$7; crushed, over 1-in., \$7.30, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended May 18 at 343,270 tons, an increase of 2160 tons.

## Middle Western

### GENERAL REVIEW

Labor situation serious; another coal famine predicted unless remedy is applied soon.

Mines in all sections of the country report a growing shortage of labor. In some localities where cars are to be had there are not men enough to load out the supply. Although cars continue to be short in various sections, nothing has so absorbed the attention of coal operators during the past week as has the labor problem. One of the principle causes for worry is the indifference of the miners and their desire to throw mines idle on the least provocation. For instance, in any locality where

soldiers are leaving on certain days for cantonments the miners declare a holiday and do not report for work. This practice has been freely discussed for some time, but the miners refute all statements by saying there were plenty of men to load all the cars that were to be had and that the mines could not work full time because of the car shortage. Union officials are working hard to remedy the situation.

The car supply has shown some improvement during the past week on many of the large coal-carrying lines. However, some roads continue to be seriously handicapped on account of congestion at the terminals. The demand for domestic size coal continues to be active and householders express a willingness to put in all the coal the dealers will deliver.

### CHICAGO

The demand far exceeds the supply; dealers unable to accumulate any stock.

The same condition that prevails throughout the country affects this market. While fine coal has been soft during the past week, there has not been anything like a sufficient supply of lump, egg and nut to take care of orders reaching the dealers. The fact that no coal is being stored confirms the statements that users are taking all the coal that reaches this market. In fact buyers are becoming restless because they cannot get coal as fast as they want it.

Quotations in the Chicago market are as follows, per net ton f. o. b. cars at mines:

	Williamson and Franklin	Saline and Harrisburg	Fulton and Peoria	Springfield	Cartersville	Grundy, La Salle, Bureau and Will
Steam lump.....	\$2.65@2.80	\$2.65@2.80	\$3.05@3.20	\$2.65@2.80	\$2.65@2.80	\$3.35@3.50
Domestic lump.....	2.65@3.00	2.65@3.00	3.05@3.20	2.65@3.00	2.65@3.00	3.35@3.50
Egg or furnace.....	2.65@3.00	2.65@3.00	3.05@3.20	2.65@3.00	2.65@3.00	3.35@3.50
Small egg or nut.....	2.65@3.00	2.65@3.00	3.05@3.20	2.65@3.00	2.65@3.00	3.35@3.50
Stove.....	2.65@3.00	2.65@3.00	3.05@3.20	2.65@3.00	2.65@3.00	3.35@3.50
Chestnut.....	2.65@3.00	2.65@3.00	3.05@3.20	2.65@3.00	2.65@3.00	3.35@3.50
Pea.....	2.65@3.00	2.65@3.00	3.05@3.20	2.65@3.00	2.65@3.00	3.35@3.50
Washed egg.....	2.85@3.00	2.85@3.00	3.05@3.20	2.85@3.00	2.85@3.00	3.35@3.50
Washed stove.....	2.85@3.00	2.85@3.00	3.05@3.20	2.85@3.00	2.85@3.00	3.35@3.50
Washed nut.....	2.85@3.00	2.85@3.00	3.05@3.20	2.85@3.00	2.85@3.00	3.35@3.50
Mine-run.....	2.45@2.60	2.45@2.60	2.85@3.00	2.45@2.60	2.45@2.60	3.10@3.25
Screenings, over 1 in.....	2.20@2.35	2.20@2.35	2.45@2.60	2.20@2.35	2.20@2.35	2.85@3.00
Washed slack.....	2.15@2.30	2.15@2.30	2.50@2.65	2.50@2.65	2.15@2.30	2.85@3.00

	Clinton and Sullivan	Knox and Greene	Eastern Kentucky
Domestic lump.....	\$2.65@2.80	\$2.65@2.80	3.10@3.25
Steam lump.....	2.65@2.80	2.65@2.80	3.10@3.25
Egg.....	2.65@2.80	2.65@2.80	3.10@3.25
Small egg or nut.....	2.65@3.00	2.65@2.80	3.10@3.25
Mine-run.....	2.40@2.55	2.40@2.55	2.85@3.00
Screenings.....	2.15@2.30	2.15@2.30	2.60@2.75

### MILWAUKEE

Coal business slow and unsatisfactory. Small dealers have no coal to deliver and consumers are awaiting the summer price schedule. Cargo receipts not up to last year's volume.

The coal situation at Milwaukee is unsatisfactory at the present time, and there is little likelihood that it will be any better until the summer price schedule is announced and dealers are in position to make deliveries. Consumers are slow in booking orders for hard coal, as they know there is not much on hand and they feel that it may be to their advantage to wait. Most of the coal dealers in Milwaukee carry no stocks, but rely upon the dock companies to furnish them with supplies as needed. Thus far the leading dock company, which serves fully 90 per cent. of the small dealers, has received only one cargo of hard coal, and that a very small one; hence all these dealers are practically out of business for the time being.

Cargo receipts up to and including May 25 aggregated 386,835 tons, of which 65,148 tons were hard coal. That slow rail service from the mines is hampering shipments is evidenced by the fact that a 10,000-ton steamer arrived this week with only 4500 tons, preferring to come up with that amount rather than wait for more cars. In May last year Milwaukee received 436,016 tons, of which 63,553 tons were hard coal.

### ST. LOUIS

Too much demand for high grade and not enough demand for low grade coal. Railroads still holding off and steam users not storing. Car situation improved on only one road. Domestic consumers continue to hold out for the best, which they cannot get, in preference to the second best, which they could get.

With the railroads buying only what they were compelled to have, and steam users refusing to store, and domestic consumers ordering high grade which they cannot get, at least for some time, and refusing the low grade, of which there is an over-supply, and the mines capable of supplying more even under conditions of car and labor

shortage, the demand for Cartersville is sustained and the prices unchanged and that for Standard is weaker, with none of the sizes except 6-in. lump bringing the Government prices.

The shortage of cars in the Cartersville and Duquoin districts continues, and the scant supplies of coal from those fields received here are used in filling orders that were filed weeks ago. New orders for high grade coal are being received and filed faster than old ones can be filled. Some domestic consumers when told how long they will have to wait for the filling of their orders agree to delivery of low grade, but to most of them winter seems a long way off and they say they will wait. Pressure is being brought to bear by publicity and otherwise to induce them to accept the coal that they can get.

Conditions are approximately normal in the Mount Olive field. In the Standard field there is no improvement in the car supply except that the Louisville & Nashville is in somewhat better shape.

Steam users are doing little storing. They make the excuse that low grade coal deteriorates in storage. In fact the deterioration in six months is slight, but even if it were considerable, the loss it is suggested, would not be as great as if, next winter, a shutdown were necessitated by fuel famine.

The announcement of a reduction of 10c. a ton in the mine price caused an immediate decline in the demand, in the expectation that other reductions might follow.

The circular here is, per net ton f. o. b. mines:

	Williamson and Franklin County	Mt. Olive and Staunton	Standard
6-in. lump.....	\$2.65@3.00	\$2.65@2.80	\$2.30@2.40
3x6-in. egg.....	2.65@3.00	2.65@2.80	2.30@2.40
2x3-in. nut.....	2.65@3.00	2.65@2.80	2.30@2.40
No. 2 nut.....	2.65@3.00	2.65@2.80	2.30@2.40
No. 3 nut.....	2.65@3.00	2.65@2.80	2.30@2.40
No. 4 nut.....	2.65@3.00	2.65@2.80	2.30@2.40
No. 5 nut.....	2.15@2.40	2.15@2.35	1.50@1.65
2-in. sergs.....	2.15@2.40	2.15@2.35	1.50@1.65
2-in. lump.....	2.15@2.40	2.15@2.35	2.30@2.40
3-in. lump.....	2.15@2.40	2.50@2.65	2.30@2.40
Steam egg.....	2.35@2.50	2.35@2.50	2.30@2.40
Mine run.....	2.45@2.60	2.45@2.60	2.00@2.15
Washed:			
No. 1.....	2.65@3.00	2.65@3.00	2.65@3.00
No. 2.....	2.65@3.00	2.65@3.00	2.65@3.00
No. 3.....	2.65@3.00	2.65@3.00	2.65@3.00
No. 4.....	2.65@3.00	2.65@3.00	2.65@3.00
No. 5.....	2.15@2.30	2.15@2.30	2.15@2.30

Williamson & Franklin Co. rate is 87½c.; other fields, 72½c.

## General Statistics

### NORFOLK & WESTERN

The following tabulation shows the coal tonnage from mines on the Norfolk & Western Ry. and from other railroads, for the month of April, 1918:

From	Net Tons
Poahontas field.....	1,361,085
Tug River field.....	287,235
Thacker field.....	252,921
Kenova field.....	92,260
Clinch Valley field.....	122,335
Other Norfolk & Western fields.....	9,586
Total Norfolk & Western fields.....	2,125,422
Williamson & Pond Creek R.R.....	168,145
Tug River & Kentucky R.R.....	51,480
All other railroads.....	112,475
Grand Total.....	2,457,522



# CURRENT PRICES—MATERIALS & SUPPLIES

## IRON AND STEEL

**STEEL SHEET PILING**—The following price is base per 100 lb. f.o.b. Pittsburgh, with a comparison of a month and a year ago:

Current 4-5	One Month Ago \$3.10	One Year Ago \$3.60
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**PIG IRON**—Below are the present quotations, with a comparison of a month and a year ago:

	Current	One Month Ago	One Year Ago
<b>CINCINNATI</b>			
No. 2 Southern foundry.....	\$35.90	\$35.50	\$42.90
No. 2 Northern foundry.....	33.26	33.26	43.00
<b>NEW YORK †</b>			
No. 2 X Northern foundry.....	34.25	34.25	45.75
No. 2 plain Northern foundry.....	33.75	33.75	45.25
No. 2 Southern foundry.....	39.00	39.00	44.25
<b>BIRMINGHAM</b>			
No. 2 Southern foundry.....	33.00	33.00	39.00
<b>CHICAGO</b>			
No. 2 Northern foundry.....	33.00	33.00	46.00
No. 2 Southern foundry.....	37.00	37.00	.....
<b>PITTSBURGH</b>			
Bessemer iron *.....	36.15	36.15	45.95
Basic iron *.....	32.00	32.00	42.00

\* These prices include the freight charge from the valley to the Pittsburgh district. † Delivered Tidewater, New York.

**STRUCTURAL MATERIAL**—The following are the base prices, f.o.b. mill, Pittsburgh, together with the quotations per 100 lb. from warehouses at the places named:

	Mill, Pittsburgh	Current	—New York— 1 Year Ago	St. Louis	Chicago
Beams, 3 to 15 in.....	\$3.00	\$4.195	\$5.00	\$4.27	\$4.20
Channels, 3 to 15 in.....	3.00	4.195	5.00	4.27	4.20
Angles, 3 to 6 in., 1/2 in. thick.....	3.00	4.195	5.00	4.27	4.20
Tees, 3 in. and larger.....	3.05	4.245	5.05	4.27	4.25
Plates.....	3.225	4.45	7.00	4.52	4.45

**BAR IRON**—Prices in cents per pound at cities named are as follows:

	Pittsburgh	St. Louis	Denver	Birmingham
	3.50	4.17	4.05	4.38

**NAILS**—Prices per keg from warehouse in cities named:

	Mill Pittsburgh	St. Louis	Denver	Chicago	Birmingham	San Francisco	Dallas
Wire.....	\$3.50	\$4.30	\$4.85	\$4.25	\$4.25	\$4.80	\$4.75
Cut.....	3.75	5.30	.....	4.40	.....	6.40	.....

**TRACK SUPPLIES**—The following prices are base per 100 lb. f.o.b. Pittsburgh for carload lots, together with the warehouse prices at the places named:

	Current	Cincinnati	Chicago	St. Louis	San Francisco	Birmingham	Denver
Standard railroad spikes 1/2-in. and larger.....	\$3.90	\$6.00	\$4.50	\$6.25	\$6.25	\$5.30	\$5.00
Track bolts.....	4.90	8.90	5.50	6.40	7.45	8.00	6.00
Standard section angle bars.....	3.25	.....	4.45	.....	4.90	.....	4.30

**COLD DRAWN STEEL SHAFTING**—From warehouse to consumers requiring fair-sized lots, the following discounts hold:

	Cincinnati	Cleveland	Chicago	St. Louis	Denver	Birmingham
17 1/2 % List	+10%	+10%	+35%	+30%		

**HORSE AND MULE SHOES**—Warehouse prices per 100 lb. in cities named:

	Mill Pittsburgh	Cincinnati	Chicago	St. Louis	Denver	Birmingham
Straight.....	\$5.25	\$6.50	\$6.50	\$6.25	\$7.50	\$7.00
Assorted.....	5.40	6.50	6.50-7.00	6.40	7.75	7.25

Cincinnati—Horseshoe nails sell for \$4.50 to \$5 per 25-lb. box

**CAST-IRON PIPE**—The following are prices per net ton for carload lots:

	Current	—New York— 1-Month Ago	One Year Ago	Chicago	St. Louis	San Francisco	Dallas
4 in.....	\$58.35	\$58.35	\$58.00	\$57.55	\$57.00	\$65.00	\$61.00
6 in. and over.....	55.35	55.35	55.50	54.55	54.00	62.00	58.00

Gas pipe and 16-ft. lengths are \$1 per ton extra.

**STEEL RAILS**—The following quotations are per ton f.o.b. Pittsburgh and Chicago for carload or larger lots. For less than carload lots 5c. per 100 lb. is charged extra:

	Current	—Pittsburgh— One Year Ago	Current	—Chicago— One Year Ago
Standard Bessemer rails.....	\$63.00	\$38.00	\$63.00	\$38.00
Standard openhearth rails.....	65.00	40.00	65.00	40.00
Light rails, 8 to 10 lb.....	*3.135 (100 lb.)	58.00	*3.135 (100 lb.)	53.00
Light rails, 12 to 14 lb.....	*3.09 (100 lb.)	57.00	*3.09 (100 lb.)	54.00
Light rails, 25 to 45 lb.....	*3.00 (100 lb.)	53.00	*3.00 (100 lb.)	52.00

\* Government price per 100 lb.

**OLD MATERIAL**—The prices following are per gross ton paid to dealers and producers in New York. In Chicago and St. Louis the quotations are per net ton and cover delivery at the buyer's works, including freight transfer charges:

	New York	Chicago	St. Louis
No. 1 railroad wrought.....	\$31.50	\$29.75	\$28.50
Stove plate.....	22.50	23.00	20.00
No. 1 machinery cast.....	34.00	26.50	21.50
Machine shop turnings.....	16.00	15.50	15.50
Cast borings.....	16.00	15.75	15.00
Railroad malleable cast.....	31.00	29.50	26.50

**COAL BIT STEEL**—Warehouse price per pound is as follows:

	New York	Cincinnati	Birmingham	St. Louis	Denver
	\$0.12	\$0.16 1/2	\$0.18	\$0.18	\$0.17

**DRILL STEEL**—Warehouse price per pound:

	New York	St. Louis	Birmingham
Solid.....	15c.	14c.	15c.
Hollow.....	24c.	25c.	.....

**PIPE**—The following discounts are for carload lots f.o.b. Pittsburgh; basing card of Nov. 6, 1917, for steel pipe and for iron pipe:

	Steel	Iron
Inches	Black	Galvanized
1, 1/2 and 2.....	44%	17%
2 1/2 to 3.....	48%	33 1/2%
3 to 4.....	51%	37 1/2%

	Steel	Iron
2.....	44%	26%
2 1/2 to 6.....	47%	28%
2 1/2 to 4.....	31 1/2%	28%
4 1/2 to 6.....	34 1/2%	28%

	Steel	Iron
1, 1/2 and 2.....	40%	33%
2 1/2 to 4.....	45%	33%
4 1/2 to 6.....	49%	36 1/2%

	Steel	Iron
2.....	42%	27%
2 1/2 to 4.....	45%	29%
4 1/2 to 6.....	44%	28%

From warehouses at the places named the following discounts hold for steel pipe:

	New York	Black Chicago	St. Louis
1/2 to 3 in. butt welded.....	38%	42.8%	40.1%
3 1/2 to 6 in. lap welded.....	18%	38.8%	36.1%

	New York	Galvanized Chicago	St. Louis
1/2 to 3 in. butt welded.....	22%	27.8%	25.1%
3 1/2 to 6 in. butt welded.....	List	24.8%	22.1%

Malleable fittings. Class B and C, from New York stock sell at list price.

Cast iron, standard sizes, 15 and 5 %.

## SHOP SUPPLIES

**NUTS**—From warehouse at the places named, on fair sized orders, the following amount is deducted from list:

	Current	—New York— One Year Ago	Current	—Cleveland— One Year Ago	Current	—Chicago— One Year Ago
Hot pressed square.....	\$1.05	\$0.50	\$1.40	\$1.65	\$1.05	\$3.00
Hot pressed hexagon.....	.85	.50	1.20	1.50	.85	3.00
Cold punched square.....	1.00	.50	.75	2.00	1.00	2.50
Cold punched hexagon.....	1.00	.50	.75	2.75	1.00	3.00

Semi-finished nuts sell at the following discounts from list price:

	Current	One Year Ago
New York.....	40%	50%
Chicago.....	50%	50%
Cleveland.....	60%	45%

**MACHINE BOLTS**—Warehouse discounts in the following cities:

	New York	Cleveland	Chicago
1/2 by 4 in. and smaller.....	30-5%	40-10%	40-10%
Larger and longer up to 1 in. by 30 in.....	30%	30-5%	35-5%

**WASHERS**—From warehouses at the places named the following amount is deducted from list price:

	New York	Cleveland	Chicago
For wrought-iron washers:			
New York.....	\$3.00	\$3.00	\$3.00
For cast-iron washers the base price per 100 lb. is as follows:			
New York.....	\$3.50	\$3.50	\$3.50

**RIVETS**—The following quotations are allowed for fair-sized orders from warehouse:

	New York	Cleveland	Chicago
Steel 1/2 and smaller.....	30%	40%	40%*
Tinned.....	30%	40%	40%*

\* For less than keg lots the discount is 35%.

Button heads, 1/2, 3/4, 1 in. diameter by 2 in. to 5 in. sell as follows per 100 lb.:

	New York	Cleveland	Chicago	Pittsburgh
New York.....	\$6.09 1/2	\$5.35	\$5.50	\$4.65
Coneheads, same sizes:				
New York.....	\$6.19 1/2	\$5.45	\$5.60	\$4.75

## MISCELLANEOUS

**GREASES**—Prices are as follows in the following cities in cents per pound for barrel lots:

	Cincinnati	Chicago	St. Louis	Birmingham	Denver	Pittsburgh
Cup.....	7	5½	6.9	7½	10½	7½
Fiber or sponge.....	8	6	7.4	7½	15	7½
Transmission.....	7	6	7.4	7½	13	7½
Axle.....	4½	4	3.6	3	5	4
Gear.....	4½	4½	7.0	7½	6	4
Car journal.....	22 (gal.)	3½	4.5	3	6	4

**BABBITT METAL**—Warehouse prices in cents per pound:

	New York	Cleveland	Chicago
	Current	Current	Current
Best grade.....	90.00	100.00	100.00
Commercial.....	50.00	22.00	22.00

**HOSE**—Following are prices of various classes of hose:

	Fire	50-Ft. Lengths
Underwriters' 2½-in.....		75c. per ft.
Common, 2½-in.....		40%
	Air	
1-in. per ft.....	First Grade \$0.55	Second Grade \$0.30
	Third Grade \$0.25	
	Steam—Discounts from list	
First grade.....	30%	Second grade..... 30-5%
		Third grade..... 40-10%

**LEATHER BELTING**—Present discounts from list in cities named:

	Medium Grade	Heavy Grade
St. Louis.....	40-5%	35%
Denver.....	35%	30%
Birmingham.....	35%	40%
Chicago.....	30-10%	40-5%
Cincinnati.....	40-10%	40%

**RAWHIDE LACING**—40% off list.

**PACKING**—Prices per pound:

Rubber and duck for low-pressure steam.....	\$0.90
Asbestos for high-pressure steam.....	1.65
Duck and rubber for piston packing.....	1.00
Flax, regular.....	90
Flax, waterproofed.....	1.10
Compressed asbestos sheet.....	1.00
Wire insertion asbestos sheet.....	1.20
Rubber sheet.....	.60
Rubber sheet, wire insertion.....	.90
Rubber sheet, duck insertion.....	.50
Rubber sheet, cloth insertion.....	.25
Asbestos packing, twisted or braided, and graphited, for valve stems and stuffing boxes.....	1.10
Asbestos wick, ½- and 1-lb. balls.....	.65 to .70

**WIRE ROPE**—Discounts from list price on regular grades of bright and galvanized are as follows:

	New York and St. Louis
Galvanized iron rigging.....	+20%
Galvanized cast steel rigging.....	List
Bright plain rigging.....	30%
Bright cast steel.....	17½%
Bright iron and iron tiller.....	5%

**MANILA ROPE**—For rope smaller than ½-in. the price is ¼ to 2c. extra; while for quantities amounting to less than 600 ft. there is an extra charge of 1c. The number of feet per pound for the various sizes is as follows: ½-in., 8 ft.; ¾-in., 6; 1-in., 4½; 1½-in., 3½; 2-in., 2½; 2½-in., 2; 3-in., 1½; 3½-in., 1¼; 4-in., 1; 4½-in., ¾; 5-in., ½; 6-in., ¼; 8-in., ¼; 10-in., ¼; 12-in., ¼; 14-in., ¼; 16-in., ¼; 18-in., ¼; 20-in., ¼; 24-in., ¼; 28-in., ¼; 32-in., ¼; 36-in., ¼; 40-in., ¼; 48-in., ¼; 56-in., ¼; 64-in., ¼; 72-in., ¼; 80-in., ¼; 96-in., ¼; 112-in., ¼; 128-in., ¼; 144-in., ¼; 160-in., ¼; 176-in., ¼; 192-in., ¼; 208-in., ¼; 224-in., ¼; 240-in., ¼; 256-in., ¼; 272-in., ¼; 288-in., ¼; 304-in., ¼; 320-in., ¼; 336-in., ¼; 352-in., ¼; 368-in., ¼; 384-in., ¼; 400-in., ¼; 416-in., ¼; 432-in., ¼; 448-in., ¼; 464-in., ¼; 480-in., ¼; 496-in., ¼; 512-in., ¼; 528-in., ¼; 544-in., ¼; 560-in., ¼; 576-in., ¼; 592-in., ¼; 608-in., ¼; 624-in., ¼; 640-in., ¼; 656-in., ¼; 672-in., ¼; 688-in., ¼; 704-in., ¼; 720-in., ¼; 736-in., ¼; 752-in., ¼; 768-in., ¼; 784-in., ¼; 800-in., ¼; 816-in., ¼; 832-in., ¼; 848-in., ¼; 864-in., ¼; 880-in., ¼; 896-in., ¼; 912-in., ¼; 928-in., ¼; 944-in., ¼; 960-in., ¼; 976-in., ¼; 992-in., ¼; 1008-in., ¼; 1024-in., ¼; 1040-in., ¼; 1056-in., ¼; 1072-in., ¼; 1088-in., ¼; 1104-in., ¼; 1120-in., ¼; 1136-in., ¼; 1152-in., ¼; 1168-in., ¼; 1184-in., ¼; 1200-in., ¼; 1216-in., ¼; 1232-in., ¼; 1248-in., ¼; 1264-in., ¼; 1280-in., ¼; 1296-in., ¼; 1312-in., ¼; 1328-in., ¼; 1344-in., ¼; 1360-in., ¼; 1376-in., ¼; 1392-in., ¼; 1408-in., ¼; 1424-in., ¼; 1440-in., ¼; 1456-in., ¼; 1472-in., ¼; 1488-in., ¼; 1504-in., ¼; 1520-in., ¼; 1536-in., ¼; 1552-in., ¼; 1568-in., ¼; 1584-in., ¼; 1600-in., ¼; 1616-in., ¼; 1632-in., ¼; 1648-in., ¼; 1664-in., ¼; 1680-in., ¼; 1696-in., ¼; 1712-in., ¼; 1728-in., ¼; 1744-in., ¼; 1760-in., ¼; 1776-in., ¼; 1792-in., ¼; 1808-in., ¼; 1824-in., ¼; 1840-in., ¼; 1856-in., ¼; 1872-in., ¼; 1888-in., ¼; 1904-in., ¼; 1920-in., ¼; 1936-in., ¼; 1952-in., ¼; 1968-in., ¼; 1984-in., ¼; 2000-in., ¼; 2016-in., ¼; 2032-in., ¼; 2048-in., ¼; 2064-in., ¼; 2080-in., ¼; 2096-in., ¼; 2112-in., ¼; 2128-in., ¼; 2144-in., ¼; 2160-in., ¼; 2176-in., ¼; 2192-in., ¼; 2208-in., ¼; 2224-in., ¼; 2240-in., ¼; 2256-in., ¼; 2272-in., ¼; 2288-in., ¼; 2304-in., ¼; 2320-in., ¼; 2336-in., ¼; 2352-in., ¼; 2368-in., ¼; 2384-in., ¼; 2400-in., ¼; 2416-in., ¼; 2432-in., ¼; 2448-in., ¼; 2464-in., ¼; 2480-in., ¼; 2496-in., ¼; 2512-in., ¼; 2528-in., ¼; 2544-in., ¼; 2560-in., ¼; 2576-in., ¼; 2592-in., ¼; 2608-in., ¼; 2624-in., ¼; 2640-in., ¼; 2656-in., ¼; 2672-in., ¼; 2688-in., ¼; 2704-in., ¼; 2720-in., ¼; 2736-in., ¼; 2752-in., ¼; 2768-in., ¼; 2784-in., ¼; 2800-in., ¼; 2816-in., ¼; 2832-in., ¼; 2848-in., ¼; 2864-in., ¼; 2880-in., ¼; 2896-in., ¼; 2912-in., ¼; 2928-in., ¼; 2944-in., ¼; 2960-in., ¼; 2976-in., ¼; 2992-in., ¼; 3008-in., ¼; 3024-in., ¼; 3040-in., ¼; 3056-in., ¼; 3072-in., ¼; 3088-in., ¼; 3104-in., ¼; 3120-in., ¼; 3136-in., ¼; 3152-in., ¼; 3168-in., ¼; 3184-in., ¼; 3200-in., ¼; 3216-in., ¼; 3232-in., ¼; 3248-in., ¼; 3264-in., ¼; 3280-in., ¼; 3296-in., ¼; 3312-in., ¼; 3328-in., ¼; 3344-in., ¼; 3360-in., ¼; 3376-in., ¼; 3392-in., ¼; 3408-in., ¼; 3424-in., ¼; 3440-in., ¼; 3456-in., ¼; 3472-in., ¼; 3488-in., ¼; 3504-in., ¼; 3520-in., ¼; 3536-in., ¼; 3552-in., ¼; 3568-in., ¼; 3584-in., ¼; 3600-in., ¼; 3616-in., ¼; 3632-in., ¼; 3648-in., ¼; 3664-in., ¼; 3680-in., ¼; 3696-in., ¼; 3712-in., ¼; 3728-in., ¼; 3744-in., ¼; 3760-in., ¼; 3776-in., ¼; 3792-in., ¼; 3808-in., ¼; 3824-in., ¼; 3840-in., ¼; 3856-in., ¼; 3872-in., ¼; 3888-in., ¼; 3904-in., ¼; 3920-in., ¼; 3936-in., ¼; 3952-in., ¼; 3968-in., ¼; 3984-in., ¼; 4000-in., ¼; 4016-in., ¼; 4032-in., ¼; 4048-in., ¼; 4064-in., ¼; 4080-in., ¼; 4096-in., ¼; 4112-in., ¼; 4128-in., ¼; 4144-in., ¼; 4160-in., ¼; 4176-in., ¼; 4192-in., ¼; 4208-in., ¼; 4224-in., ¼; 4240-in., ¼; 4256-in., ¼; 4272-in., ¼; 4288-in., ¼; 4304-in., ¼; 4320-in., ¼; 4336-in., ¼; 4352-in., ¼; 4368-in., ¼; 4384-in., ¼; 4400-in., ¼; 4416-in., ¼; 4432-in., ¼; 4448-in., ¼; 4464-in., ¼; 4480-in., ¼; 4496-in., ¼; 4512-in., ¼; 4528-in., ¼; 4544-in., ¼; 4560-in., ¼; 4576-in., ¼; 4592-in., ¼; 4608-in., ¼; 4624-in., ¼; 4640-in., ¼; 4656-in., ¼; 4672-in., ¼; 4688-in., ¼; 4704-in., ¼; 4720-in., ¼; 4736-in., ¼; 4752-in., ¼; 4768-in., ¼; 4784-in., ¼; 4800-in., ¼; 4816-in., ¼; 4832-in., ¼; 4848-in., ¼; 4864-in., ¼; 4880-in., ¼; 4896-in., ¼; 4912-in., ¼; 4928-in., ¼; 4944-in., ¼; 4960-in., ¼; 4976-in., ¼; 4992-in., ¼; 5008-in., ¼; 5024-in., ¼; 5040-in., ¼; 5056-in., ¼; 5072-in., ¼; 5088-in., ¼; 5104-in., ¼; 5120-in., ¼; 5136-in., ¼; 5152-in., ¼; 5168-in., ¼; 5184-in., ¼; 5200-in., ¼; 5216-in., ¼; 5232-in., ¼; 5248-in., ¼; 5264-in., ¼; 5280-in., ¼; 5296-in., ¼; 5312-in., ¼; 5328-in., ¼; 5344-in., ¼; 5360-in., ¼; 5376-in., ¼; 5392-in., ¼; 5408-in., ¼; 5424-in., ¼; 5440-in., ¼; 5456-in., ¼; 5472-in., ¼; 5488-in., ¼; 5504-in., ¼; 5520-in., ¼; 5536-in., ¼; 5552-in., ¼; 5568-in., ¼; 5584-in., ¼; 5600-in., ¼; 5616-in., ¼; 5632-in., ¼; 5648-in., ¼; 5664-in., ¼; 5680-in., ¼; 5696-in., ¼; 5712-in., ¼; 5728-in., ¼; 5744-in., ¼; 5760-in., ¼; 5776-in., ¼; 5792-in., ¼; 5808-in., ¼; 5824-in., ¼; 5840-in., ¼; 5856-in., ¼; 5872-in., ¼; 5888-in., ¼; 5904-in., ¼; 5920-in., ¼; 5936-in., ¼; 5952-in., ¼; 5968-in., ¼; 5984-in., ¼; 6000-in., ¼; 6016-in., ¼; 6032-in., ¼; 6048-in., ¼; 6064-in., ¼; 6080-in., ¼; 6096-in., ¼; 6112-in., ¼; 6128-in., ¼; 6144-in., ¼; 6160-in., ¼; 6176-in., ¼; 6192-in., ¼; 6208-in., ¼; 6224-in., ¼; 6240-in., ¼; 6256-in., ¼; 6272-in., ¼; 6288-in., ¼; 6304-in., ¼; 6320-in., ¼; 6336-in., ¼; 6352-in., ¼; 6368-in., ¼; 6384-in., ¼; 6400-in., ¼; 6416-in., ¼; 6432-in., ¼; 6448-in., ¼; 6464-in., ¼; 6480-in., ¼; 6496-in., ¼; 6512-in., ¼; 6528-in., ¼; 6544-in., ¼; 6560-in., ¼; 6576-in., ¼; 6592-in., ¼; 6608-in., ¼; 6624-in., ¼; 6640-in., ¼; 6656-in., ¼; 6672-in., ¼; 6688-in., ¼; 6704-in., ¼; 6720-in., ¼; 6736-in., ¼; 6752-in., ¼; 6768-in., ¼; 6784-in., ¼; 6800-in., ¼; 6816-in., ¼; 6832-in., ¼; 6848-in., ¼; 6864-in., ¼; 6880-in., ¼; 6896-in., ¼; 6912-in., ¼; 6928-in., ¼; 6944-in., ¼; 6960-in., ¼; 6976-in., ¼; 6992-in., ¼; 7008-in., ¼; 7024-in., ¼; 7040-in., ¼; 7056-in., ¼; 7072-in., ¼; 7088-in., ¼; 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10752-in., ¼; 10768-in., ¼; 10784-in., ¼; 10800-in., ¼; 10816-in., ¼; 10832-in., ¼; 10848-in., ¼; 10864-in., ¼; 10880-in., ¼; 10896-in., ¼; 10912-in., ¼; 10928-in., ¼; 10944-in., ¼; 10960-in., ¼; 10976-in., ¼; 10992-in., ¼; 11008-in., ¼; 11024-in., ¼; 11040-in., ¼; 11056-in., ¼; 11072-in., ¼; 11088-in., ¼; 11104-in., ¼; 11120-in., ¼; 11136-in., ¼; 11152-in., ¼; 11168-in., ¼; 11184-in., ¼; 11200-in., ¼; 11216-in., ¼; 11232-in., ¼; 11248-in., ¼; 11264-in., ¼; 11280-in., ¼; 11296-in., ¼; 11312-in., ¼; 11328-in., ¼; 11344-in., ¼; 11360-in., ¼; 11376-in., ¼; 11392-in., ¼; 11408-in., ¼; 11424-in., ¼; 11440-in., ¼; 11456-in., ¼; 11472-in., ¼; 11488-in., ¼; 11504-in., ¼; 11520-in., ¼; 11536-in., ¼; 11552-in., ¼; 11568-in., ¼; 11584-in., ¼; 11600-in., ¼; 11616-in., ¼; 11632-in., ¼; 11648-in., ¼; 11664-in., ¼; 11680-in., ¼; 11696-in., ¼; 11712-in., ¼; 11728-in., ¼; 11744-in., ¼; 11760-in., ¼; 11776-in., ¼; 11792-in., ¼; 11808-in., ¼; 11824-in., ¼; 11840-in., ¼; 11856-in., ¼; 11872-in., ¼; 11888-in., ¼; 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13056-in., ¼; 13072-in., ¼; 13088-in., ¼; 13104-in., ¼; 13120-in., ¼; 13136-in., ¼; 13152-in., ¼; 13168-in., ¼; 13184-in., ¼; 13200-in., ¼; 13216-in., ¼; 13232-in., ¼; 13248-in., ¼; 13264-in., ¼; 13280-in., ¼; 13296-in., ¼; 13312-in., ¼; 13328-in., ¼; 13344-in., ¼; 13360-in., ¼; 13376-in., ¼; 13392-in., ¼; 13408-in., ¼; 13424-in., ¼; 13440-in., ¼; 13456-in., ¼; 13472-in., ¼; 13488-in., ¼; 13504-in., ¼; 13520-in., ¼; 13536-in., ¼; 13552-in., ¼; 13568-in., ¼; 13584-in., ¼; 13600-in., ¼; 13616-in., ¼; 13632-in., ¼; 13648-in., ¼; 13664-in., ¼; 13680-in., ¼; 13696-in., ¼; 13712-in., ¼; 13728-in., ¼; 13744-in., ¼; 13760-in., ¼; 13776-in., ¼; 13792-in., ¼; 13808-in., ¼; 13824-in., ¼; 13840-in., ¼; 13856-in., ¼; 13872-in., ¼; 13888-in., ¼; 13904-in., ¼; 13920-in., ¼; 13936-in., ¼; 13952-in., ¼; 13968-in., ¼; 13984-in., ¼; 14000-in., ¼; 14016-in., ¼; 14032-in., ¼; 14048-in., ¼; 14064-in., ¼; 14080-in., ¼; 14096-in., ¼; 14112-in., ¼; 14128-in., ¼; 14144-in., ¼; 14160-in., ¼; 14176-in., ¼; 14192-in., ¼; 14208-in., ¼; 14224-in., ¼; 14240-in., ¼; 14256-in., ¼; 14272-in., ¼; 14288-in., ¼; 14304-in., ¼; 14320-in., ¼; 14336-in., ¼; 14352-in., ¼; 14368-in., ¼; 14384-in., ¼; 14400-in., ¼; 14416-in., ¼; 14432-in., ¼; 14448-in., ¼; 14464-in., ¼; 14480-in., ¼; 14496-in., ¼; 14512-in., ¼; 14528-in., ¼; 14544-in., ¼; 14560-in., ¼; 14576-in., ¼; 14592-in., ¼; 14608-in., ¼; 14624-in., ¼; 14640-in., ¼; 14656-in., ¼; 14672-in., ¼; 14688-in., ¼; 14704-in., ¼; 14720-in., ¼; 14736-in., ¼; 14752-in., ¼; 14768-in., ¼; 14784-in., ¼; 14800-in., ¼; 14816-in., ¼; 14832-in., ¼; 14848-in., ¼; 14864-in., ¼; 14880-in., ¼; 14896-in., ¼; 14912-in., ¼; 14928-in., ¼; 14944-in., ¼; 14960-in., ¼; 14976-in., ¼; 14992-in., ¼; 15008-in., ¼; 15024-in., ¼; 15040-in., ¼; 15056-in., ¼; 15072-in., ¼; 15088-in., ¼; 15104-in., ¼; 15120-in., ¼; 15136-in., ¼; 15152-in., ¼; 15168-in., ¼; 15184-in., ¼; 15200-in., ¼; 15216-in., ¼; 15232-in., ¼; 15248-in., ¼; 15264-in., ¼; 15280-in., ¼; 15296-in., ¼; 15312-in., ¼; 15328-in., ¼; 15344-in., ¼; 15360-in., ¼; 15376-in., ¼; 15392-in.,